SONY

UHF SYNTHESIZED TRANSMITTER

WRT-808A

SERVICE MANUAL

U Model

1st Edition

WRT-808A (U) E
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Sony Corporation
Broadcasting & Professional Systems Company

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⚠警告

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お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres.
Pour toute réparation faire appel à une personne compétente uniquement.

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SONY

3-866-919-**12** (1)

UHF Synthesized Transmitter

Operating Instructions US
Mode d'emploi FR
Manual de instrucciones ES
Wireless Channel Lists / Listes des canaux sans fil / Listas de canales inalámbricos

WRT-808A

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U64 U66 U68

Owner's Record

The model and serial numbers are located at the rear of the unit. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. WRT-808A Serial No. _____

Notice for customers in the U.S.A.
Use of Sony wireless devices is regulated by the Federal Communications Commission as described in Part 74 subpart H of the FCC regulations and users authorized thereby are required to obtain an appropriate licence.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Notice for customers in Canada:

Use of Sony wireless devices is regulated by the Industry Canada as described in their Radio Standard Specification RSS-123.
A licence is normally required. The local district office of Industry Canada should therefore be contacted. When the operation of the device is within the broadcast band, the licence is issued on no-interference, no-protection basis with respect to broadcast signals.

Operation of this device is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Avis pour les clients au Canada:

L'usage des appareils sans-fil Sony est réglé par l'Industrie Canada comme décrit dans leur Cahier des Normes Radioélectriques CNR-123.
Une licence est normalement requise. Le bureau de l'Industrie Canada doit être contacté. Lorsque l'opération de l'appareil est dans les limites de la bande de radiodiffusion, la licence est émanée sur la base de non-interférence, non-protection avec les signaux de radiodiffusion.

L'utilisation de cet appareil est soumise aux deux conditions suivantes : (1) cet appareil ne peut causer d'interférences, et (2) cet appareil doit accepter toutes les interférences, y compris les interférences capables de provoquer un fonctionnement indésirable de l'appareil.

English

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Precautions

- The unit is designed for use in ambient temperature range of 0°C to 50°C (32°F to 122°F).
- Do not place the unit on or near heat sources, such as lighting equipment, power amplifiers, or in a place subject to direct sunlight or excessive moisture. In such places, the external finish or internal parts of the unit may be damaged.
- If the unit is used in a very humid or dusty place or in a place subject to an active gas, clean its surface as well as the connectors with a dry, soft cloth soon after use. Lengthy use of the unit in such places or not cleaning it after its use in such places may shorten its life.
- When cleaning the unit, never use organic solvents such as thinners or benzine, which will damage the finish of the unit.
- The unit has been factory adjusted precisely. Do not tamper with its internal parts or attempt to repair it.

Section 1
Operating Instructions

This section is extracted from operation manual.

Overview

The WRT-808A is a transmitter which converts a hand-held dynamic microphone into a wireless microphone, ensuring excellent sound quality of the microphone itself and providing the convenience especially for Electronic News Gathering (ENG), live and other Electronic Field Production (EFP) applications. Combining with 800 MHz band Sony UHF wireless microphone system, use this highly reliable transmitter for broadcast and movie production purpose.

Wireless Channels Selectable

The transmitter and tuner of the wireless microphone system are classified by frequency band.
A 12-MHz frequency band (or two consecutive-numbered TV channels, such as 68 and 69 of the WRT-808A/68 model) is assigned to each transmitter and tuner model.

In building a UHF wireless microphone system, be sure to combine a transmitter and a tuner having the same TV channel number.

U68 model
A 794-806 MHz frequency band is assigned to the WRT-808A/68 model, permitting it to operate on any of 94 carrier frequencies in 125-kHz steps of Sony original channel plan in the range of TV channels 68 and 69.

For the selectable channels, see "Wireless Channel Lists" on page L-1.

U66 model
A 782-794MHz frequency band is assigned to the WRT-808A/66 model, permitting it to operate on any of 94 carrier frequencies in 125-kHz steps of Sony original channel plan in the range of TV channels 66 and 67.

For the selectable channels, see "Wireless Channel Lists" on page L-2.

U64 model
A 770-782 MHz frequency band is assigned to the WRT-808A/64 model, permitting it to operate on any of 94 carrier frequencies in 125-kHz steps of Sony original channel plan in the range of TV channels 64 and 65.

For the selectable channels, see "Wireless Channel Lists" on page L-3.

Features

Easy selection of 94 channels
The PLL synthesized system assures easy selection of 94 channels and full compatibility with Sony 800 MHz series wireless microphone system.

Easy and reliable connection
The WRT-808A can be adapted to a wide variety of wired microphone which has a XLR audio connector. The reliable connection assures the noise-free operation.

Compact and lightweight
High density mounting technology enables this compact and light weight transmitter, to allow you to move anywhere for Electronic News Gathering (ENG) and Electronic Field Production (EFP).

Operation powered by easily available batteries
Approximately four hours of continuous operation is ensured with two AA-size (LR6) alkaline batteries. By virtue of DC-DC converter, consistent output power is assured over the life of the batteries.

Battery status information on both transmitter and tuner
To avoid the battery failure, the WRT-808A shows the battery status with the LED indication in green, red and flashing. About one hour before the battery exhausted, the WRT-808A gives the battery information to make the alarm on the tuner WRR-800A/801A/805A/850A.

LED indication of audio input
The AF/PEAK indicator allows you to comprehend the condition of audio input level at a glance.

Continuous control of input attenuation
When an excessively strong audio signal is inputted, the input level can be adjusted in the range of 0 to 50 dB continuously.
When setting the 50 dB attenuation, the WRT-808A can accept +4 dB (maximum 20 dB) line level input.

Selectable RF power output
You can select the RF output level either 50 mW or 10 mW to suit the operating condition.

Overview

System Configuration

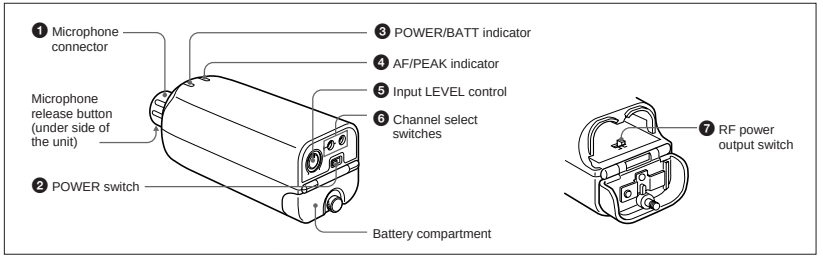
The WRT-808A can be used with the WRR-800A/801A UHF synthesized Diversity Tuner and also can be used with the WRR-820A/840A/850A/855A UHF Synthesized Diversity Tuner.

Sony 800 MHz band system models

WRT-808A	Frequency band		Model name	
	TV channel	Frequency (MHz)	Transmitter or microphone	Tuner
U64	64	770.125 - 775.875	WRT-805A WRT-807A **WRT-808A** WRT-810A WRT-820A WRT-822A WRT-830A[a)] WRT-860A WRT-867A[a)]	WRR-800A WRR-801A WRR-802A WRR-805A WRR-810A WRR-820A[b)] WRR-840A[b)] WRR-850A[b)] WRR-855A WRR-860A[a)] MB-806A
	65	776.125 - 781.875		
U66	66	782.125 - 787.875		
	67	788.125 - 793.875		
U68	68	794.125 - 799.875		
	69	800.125 - 805.875		

a) These models cover only 68 and 69 channels.
b) For these models, the AN-820A UHF antenna and the WD-820A UHF antenna divider are required.

Parts Identification



1 Microphone connector
Connect to a dynamic microphone which has a XLR type connector.

2 POWER switch
Turns the power of the transmitter ON or OFF.

3 POWER/BATT indicator
When turning on the unit, the POWER/BATT indicator lights in green. While in operation, the LED indicates the battery condition.
See "Power Supply" on page 8.

4 AF (audio frequency) /PEAK indicator
The AF/PEAK indicator lights in green when the supplied audio frequency level is over the reference level. It lights in red when the signal reaches the maximum level.

5 Input LEVEL control
Controls the input attenuation level.
"–60" position provides 0 dB attenuation, and "–10" position provides 50 dB attenuation.

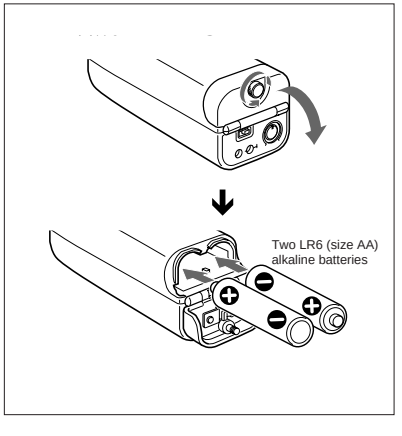
6 Channel select switches
Select the transmitting channel.
See "Channel Setting" on page 9.

7 RF power output switch
In normal use, set the switch to "50".
See "Use of RF power output switch" on page 11.

Power Supply

The transmitter can operate on two LR6 (size AA) alkaline batteries continuously for about 4 hours at 25°C (77°F).

Installing the batteries



1 Turn the battery-compartment screw counterclockwise.

2 Match the polarities and insert the batteries.

3 Close the lid.

Battery indication

When you turn the power on, the POWER/BATT indicator lights in green.

While in operation, the POWER/BATT indicator shows the battery condition as shown below.
Lights in green: Good
Lights in red: The battery level is low. About one hour is left for continuous operation.
Flashing in red: The batteries are almost exhausted. The unit does not work.

Promptly replace the batteries when the POWER/BATT indicator lights in red or flashes.

When the POWER/BATT indicator lights in red on this unit, the BATT indication on the tuner (WRR-800A/801A/805A/850A) starts flashing as a warning.

Note
The indication may be incorrect if the batteries are not new when installed. If you plan to use the transmitter for a long period, it is best to replace the batteries with new ones.

Notes on batteries

- Use new alkaline batteries, and check the recommended "useby" date on the bottom of the batteries.
- Do not pair different types of batteries.
- Always replace the two batteries together.
- The batteries are not rechargeable.
- Be careful to install the batteries with the correct polarity.
- When not using the transmitter for a long period, remove the batteries to avoid leakage. If the batteries do leak, clean all leakage from the unit. Leakage left in the unit may cause poor battery contact. If there seems to be poor battery contact, consult your Sony dealer.

Channel setting

Notes

- If the channel select switches are operated while the transmitter is on, the POWER/BATT indicator flashes in green as a warning.
- If you set to any channel other than those listed in "Wireless Channel Lists" on pages L-1 to L-3, the POWER/BATT indicator flashes in green as a warning.
- While the POWER/BATT indicator is flashing, the RF output signal send from the transmitter becomes lower than the usable level.
  While POWER/BATT indicator on the transmitter is flashing, the RF input indicator on the tuner may light, if the transmitter locates near the tuner.
  Though the RF input indicator lights on the tuner, the Sony tuner (equipped with muting function) makes neither noise nor audio output.
- Make sure that the channel selected is the same as that selected on the tuner used in the same system.
- If there is a TV broadcasting station near by, do not use the station's channel.

Channel Setting

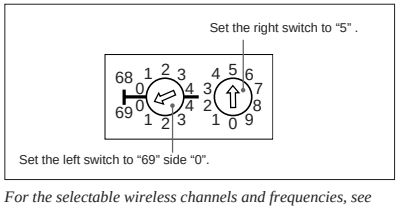
Caution

Turn off the transmitter when setting the transmitting channel to eliminate interference or noise on other wireless equipment.

Each "Wireless Channel" is represented on the unit by a 2-digit TV channel number followed by another 2-digit number, for example: 69-05.

Set the channel select switches for the desired channel by using a screw driver.
The left switch selects the TV band and the 10's digit of the transmitting channel. The right switch selects the 1's digit of the transmitting channel.

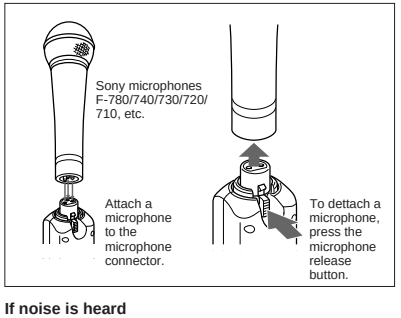
Example: when channel 69-05 is selected for U68 model



For the selectable wireless channels and frequencies, see "Wireless Channel Lists" on pages L-1 to L-3.

Microphone System Operation

Microphone connection


Sony microphones F-780/740/730/720/710, etc.
Attach a microphone to the microphone connector.
To dettach a microphone, press the microphone release button.

If noise is heard

Depending on the environment where the system is installed, outside noise or radio wave may disrupt the transmission of certain channels.
To select a channel under this circumstance, turn off the transmitter. Select a channel on the tuner, at which the RF indicator is off. (A channel free from noise or radio wave interference is selected.) Then, set the same channel on the transmitter.

Use of RF power output switch

The RF power output switch (located inside of the battery compartment) selects the RF power output either 50 mW or 10 mW. In normal use, set the switch to "50" (factory preset position).

50 mW output is suitable for optimum transmission over long working distance.
10 mW output will be suitable for multi-channel operation to eliminate the interference.

Use of input LEVEL control

When the AF/PEAK indicator lights in green continuously, the supplied audio signal is continuously over the reference level. If this occurs, use the input LEVEL control to avoid sound distortion.
By turning the control to "–10", the WRT-808A provides 50 dB input attenuation and can be inputted +4 dB (maximum 20 dB) line level signal.

Notes on microphone system operation

- To operate with two or more channels, maintain a distance of at least 30 cm (one ft.) between each pair of transmitters.
  For details of operation with two or more channels, refer to the Operating Instructions for the WRR-800A/801A/805A, etc.
- Ensure that the transmitter set to channels not being used are either turned off or set to the minimum output level.
- When powering the transmitter on or off, to keep the noise to a minimum, set the audio output level from the tuner or mixer to a minimum.
- Powering the transmitter on without checking the channel selection first may interfere with the operation of other microphones/transmitters, if the current setting is already being used.
- To prevent noise generation, keep the transmitters at least 3m (10 feet) away from the tuner antennas when the system is operated using a group which allows selection of up to 11 channels.
- Do not grip the transmitter while using as it will significantly degrade good performance, causing dropouts, etc. Hold the microphone itself as shown.

Specifications

Transmitter and modulation section

Oscillator	Crystal controlled PLL synthesizer
Carrier frequencies	
U64 model:	770.125 to 781.875 MHz (94 settings at 125 kHz intervals)
U66 model:	782.125 to 793.875 MHz (94 settings at 125 kHz intervals)
U68 model:	794.125 to 805.875 MHz (94 settings at 125 kHz intervals)
RF power output	50 mW/10 mW selectable
Frequency stability	Within ±0.005%
Tone signal	32.768 kHz
Type of emission	110KF3E
Type of antenna	Internal, 1/4 - wave length wire
Pre-emphasis	50 µs
Deviation	±5 kHz (–60 dBV 1), 1 kHz input, with 0 dB audio attenuation)
Frequency response	70 to 15,000 Hz
Signal-to-noise ratio	57 dB or more (A-weighted, with reference deviation at WRR-800A/801A)
Audio attenuator	0 to 50 dB
Maximum input	+26 dBV (1 kHz, with 50 dB audio attenuation)

Power section

Power requirements	3.0 V DC (two LR6/size AA alkaline batteries)
Battery life	Approx. 4 hours at 25° C (77° F) with Sony LR6 alkaline batteries

General

Operating temperature	0° C to +50° C (32° F to 122° F)
Storage temperature	–30° C to +60° C (–22° F to +140° F)
Dimensions	40 × 108 × 40 mm (w/h/d) ($1^5/_8 \times 4^3/_8 \times 1^5/_8$ inches)
Mass	Approx. 175 g (6 oz) including batteries

Supplied accessory

Operating Instructions (1)

Design and specifications are subject to change without notice.

1) 0 dBV = 1 Vrms

Wireless Channel Lists / Listes des canaux sans fil / Listas de canales inalámbricos

For 68-Version Model Using TV Channels 68 and 69 / Pour le modèle 68 utilisant les canaux de télévision 68 et 69 / Para modelos de la versión 68 que utilizan los canales de TV 68 y 69

Channel Canal	Frequency(MHz) Fréquence Frecuencia	Channel Canal	Frequency(MHz) Fréquence Frecuencia	Channel Canal	Frequency(MHz) Fréquence Frecuencia	Channel Canal	Frequency(MHz) Fréquence Frecuencia
68-01	794.125	68-25	797.125	69-01	800.125	69-25	803.125
68-02	794.250	68-26	797.250	69-02	800.250	69-26	803.250
68-03	794.375	68-27	797.375	69-03	800.375	69-27	803.375
68-04	794.500	68-28	797.500	69-04	800.500	69-28	803.500
68-05	794.625	68-29	797.625	69-05	800.625	69-29	803.625
68-06	794.750	68-30	797.750	69-06	800.750	69-30	803.750
68-07	794.875	68-31	797.875	69-07	800.875	69-31	803.875
68-08	795.000	68-32	798.000	69-08	801.000	69-32	804.000
68-09	795.125	68-33	798.125	69-09	801.125	69-33	804.125
68-10	795.250	68-34	798.250	69-10	801.250	69-34	804.250
68-11	795.375	68-35	798.375	69-11	801.375	69-35	804.375
68-12	795.500	68-36	798.500	69-12	801.500	69-36	804.500
68-13	795.625	68-37	798.625	69-13	801.625	69-37	804.625
68-14	795.750	68-38	798.750	69-14	801.750	69-38	804.750
68-15	795.875	68-39	798.875	69-15	801.875	69-39	804.875
68-16	796.000	68-40	799.000	69-16	802.000	69-40	805.000
68-17	796.125	68-41	799.125	69-17	802.125	69-41	805.125
68-18	796.250	68-42	799.250	69-18	802.250	69-42	805.250
68-19	796.375	68-43	799.375	69-19	802.375	69-43	805.375
68-20	796.500	68-44	799.500	69-20	802.500	69-44	805.500
68-21	796.625	68-45	799.625	69-21	802.625	69-45	805.625
68-22	796.750	68-46	799.750	69-22	802.750	69-46	805.750
68-23	796.875	68-47	799.875	69-23	802.875	69-47	805.875
68-24	797.000			69-24	803.000		

L-1

For 64-Version Model Using TV Channels 64 and 65 / Pour le modèle 64 utilisant les canaux de télévision 64 et 65 / Para modelos de la versión 64 que utilizan los canales de TV 64 y 65

Channel Canal	Frequency(MHz) Fréquence Frecuencia	Channel Canal	Frequency(MHz) Fréquence Frecuencia	Channel Canal	Frequency(MHz) Fréquence Frecuencia	Channel Canal	Frequency(MHz) Fréquence Frecuencia
64-01	770.125	64-25	773.125	65-01	776.125	65-25	779.125
64-02	770.250	64-26	773.250	65-02	776.250	65-26	779.250
64-03	770.375	64-27	773.375	65-03	776.375	65-27	779.375
64-04	770.500	64-28	773.500	65-04	776.500	65-28	779.500
64-05	770.625	64-29	773.625	65-05	776.625	65-29	779.625
64-06	770.750	64-30	773.750	65-06	776.750	65-30	779.750
64-07	770.875	64-31	773.875	65-07	776.875	65-31	779.875
64-08	771.000	64-32	774.000	65-08	777.000	65-32	780.000
64-09	771.125	64-33	774.125	65-09	777.125	65-33	780.125
64-10	771.250	64-34	774.250	65-10	777.250	65-34	780.250
64-11	771.375	64-35	774.375	65-11	777.375	65-35	780.375
64-12	771.500	64-36	774.500	65-12	777.500	65-36	780.500
64-13	771.625	64-37	774.625	65-13	777.625	65-37	780.625
64-14	771.750	64-38	774.750	65-14	777.750	65-38	780.750
64-15	771.875	64-39	774.875	65-15	777.875	65-39	780.875
64-16	772.000	64-40	775.000	65-16	778.000	65-40	781.000
64-17	772.125	64-41	775.125	65-17	778.125	65-41	781.125
64-18	772.250	64-42	775.250	65-18	778.250	65-42	781.250
64-19	772.375	64-43	775.375	65-19	778.375	65-43	781.375
64-20	772.500	64-44	775.500	65-20	778.500	65-44	781.500
64-21	772.625	64-45	775.625	65-21	778.625	65-45	781.625
64-22	772.750	64-46	775.750	65-22	778.750	65-46	781.750
64-23	772.875	64-47	775.875	65-23	778.875	65-47	781.875
64-24	773.000			65-24	779.000		

L-3

For 66-Version Model Using TV Channels 66 and 67 / Pour le modèle 66 utilisant les canaux de télévision 66 et 67 / Para modelos de la versión 66 que utilizan los canales de TV 66 y 67

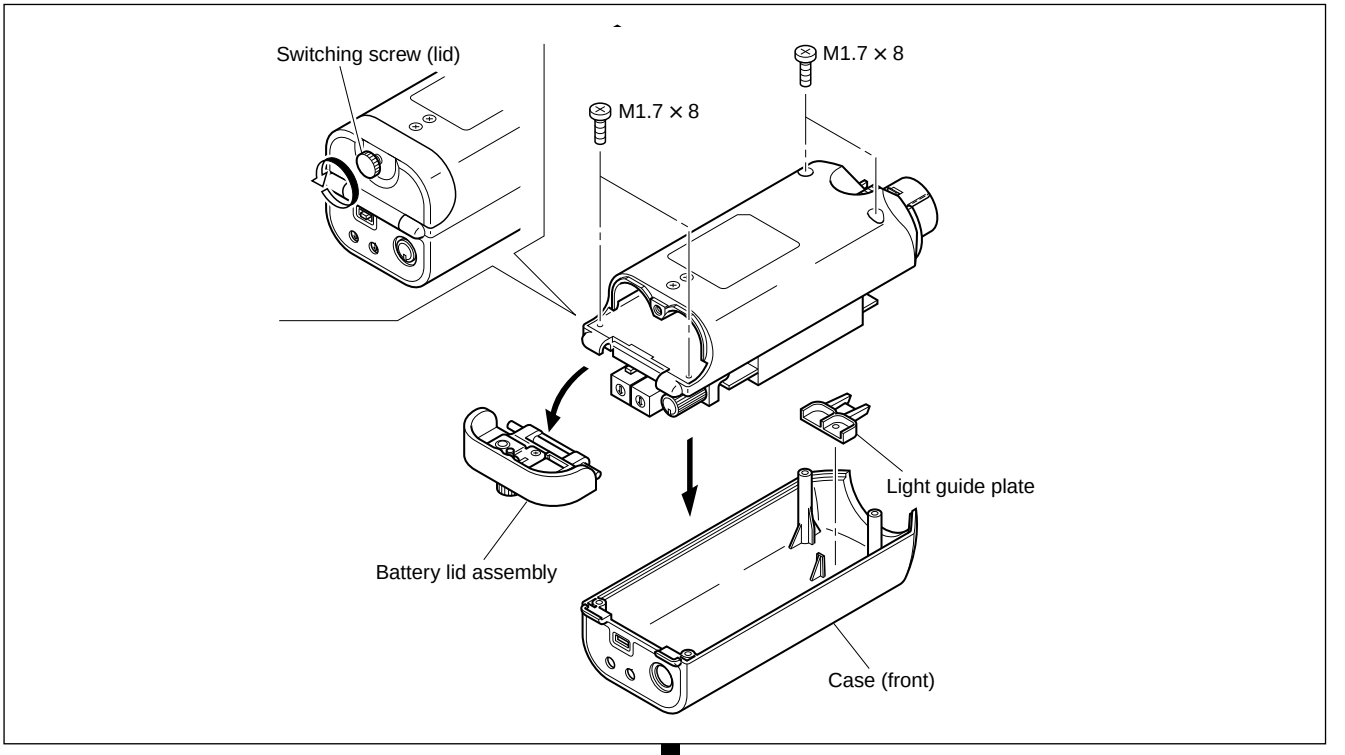
Channel Canal	Frequency(MHz) Fréquence Frecuencia	Channel Canal	Frequency(MHz) Fréquence Frecuencia	Channel Canal	Frequency(MHz) Fréquence Frecuencia	Channel Canal	Frequency(MHz) Fréquence Frecuencia
66-01	782.125	66-25	785.125	67-01	788.125	67-25	791.125
66-02	782.250	66-26	785.250	67-02	788.250	67-26	791.250
66-03	782.375	66-27	785.375	67-03	788.375	67-27	791.375
66-04	782.500	66-28	785.500	67-04	788.500	67-28	791.500
66-05	782.625	66-29	785.625	67-05	788.625	67-29	791.625
66-06	782.750	66-30	785.750	67-06	788.750	67-30	791.750
66-07	782.875	66-31	785.875	67-07	788.875	67-31	791.875
66-08	783.000	66-32	786.000	67-08	789.000	67-32	792.000
66-09	783.125	66-33	786.125	67-09	789.125	67-33	792.125
66-10	783.250	66-34	786.250	67-10	789.250	67-34	792.250
66-11	783.375	66-35	786.375	67-11	789.375	67-35	792.375
66-12	783.500	66-36	786.500	67-12	789.500	67-36	792.500
66-13	783.625	66-37	786.625	67-13	789.625	67-37	792.625
66-14	783.750	66-38	786.750	67-14	789.750	67-38	792.750
66-15	783.875	66-39	786.875	67-15	789.875	67-39	792.875
66-16	784.000	66-40	787.000	67-16	790.000	67-40	793.000
66-17	784.125	66-41	787.125	67-17	790.125	67-41	793.125
66-18	784.250	66-42	787.250	67-18	790.250	67-42	793.250
66-19	784.375	66-43	787.375	67-19	790.375	67-43	793.375
66-20	784.500	66-44	787.500	67-20	790.500	67-44	793.500
66-21	784.625	66-45	787.625	67-21	790.625	67-45	793.625
66-22	784.750	66-46	787.750	67-22	790.750	67-46	793.750
66-23	784.875	66-47	787.875	67-23	790.875	67-47	793.875
66-24	785.000			67-24	791.000		

L-2

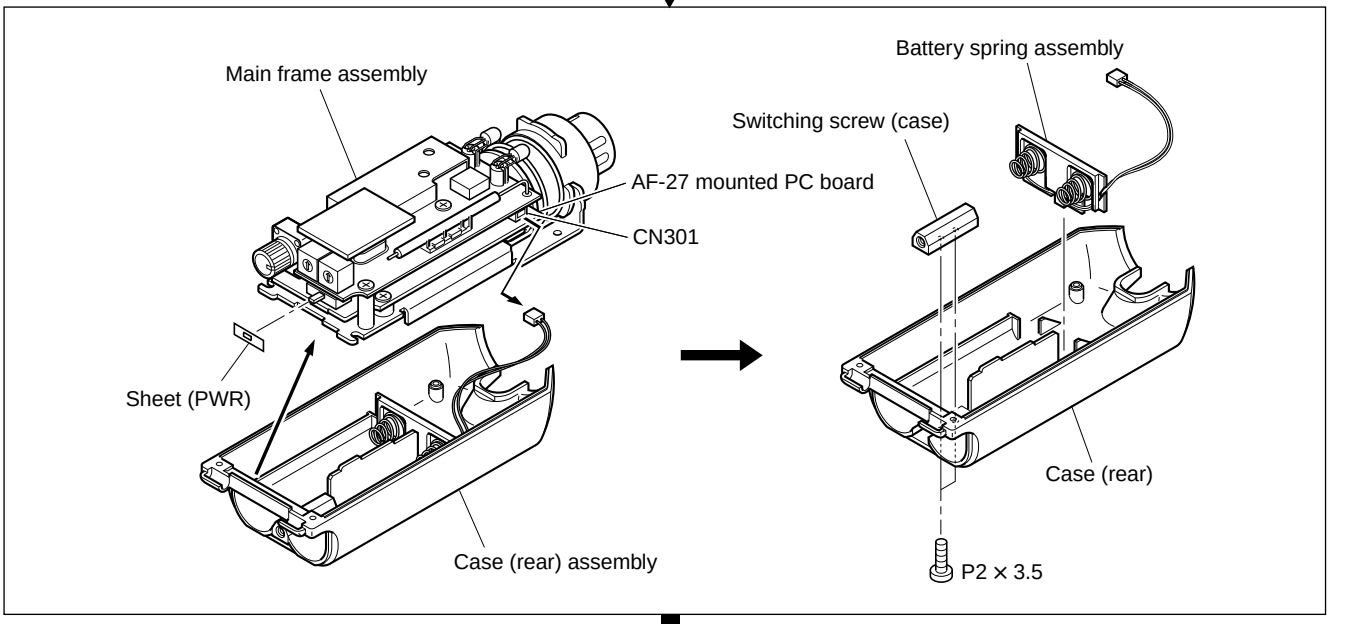
Section 2
Service Overview

2-1. Disassembly

Case (front), Battery lid assembly

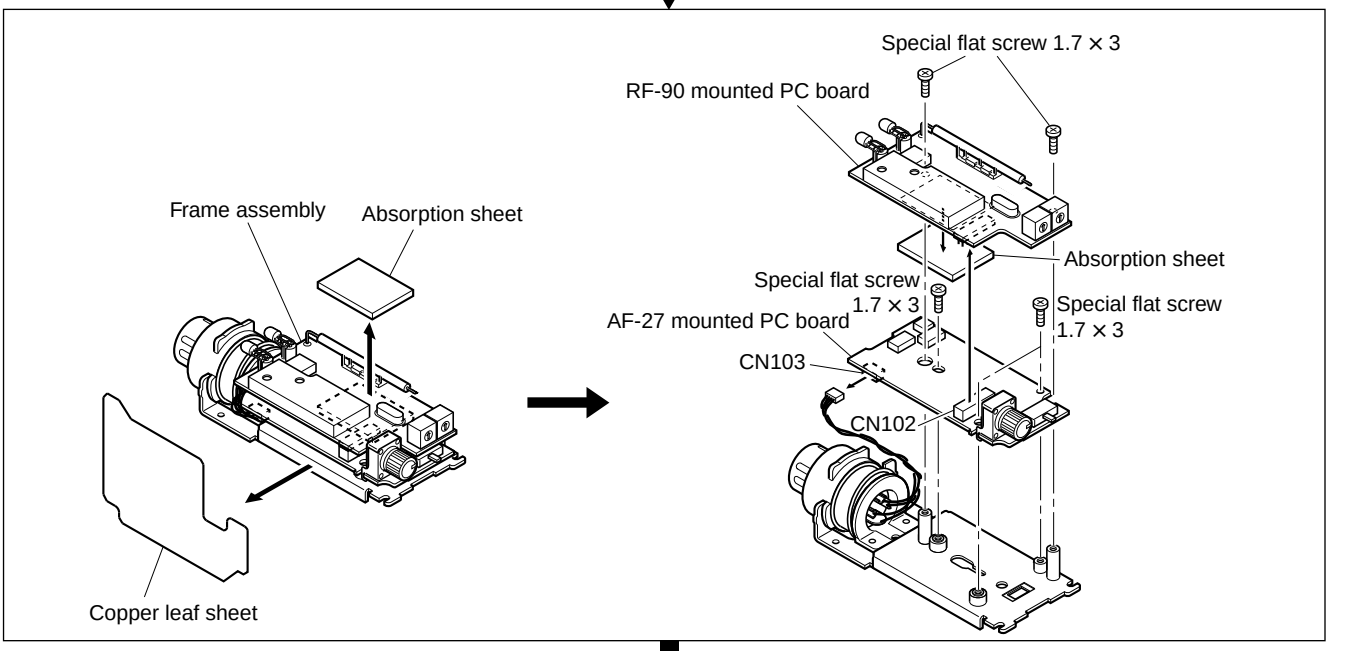


Main frame assembly, Case (rear), Battery spring assembly

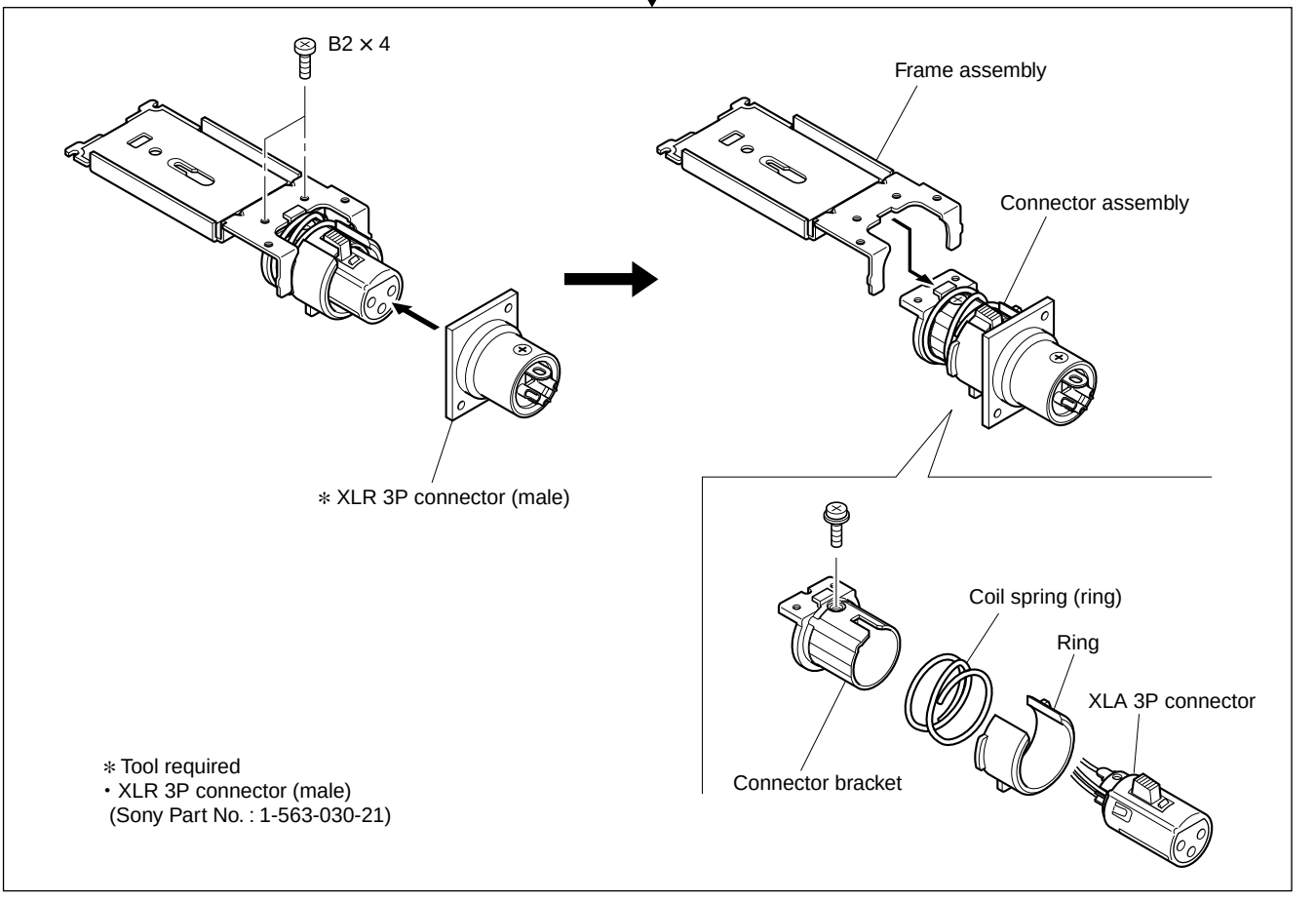


to page 2-2

RF-90 mounted PC board,
AF-27 mounted PC board

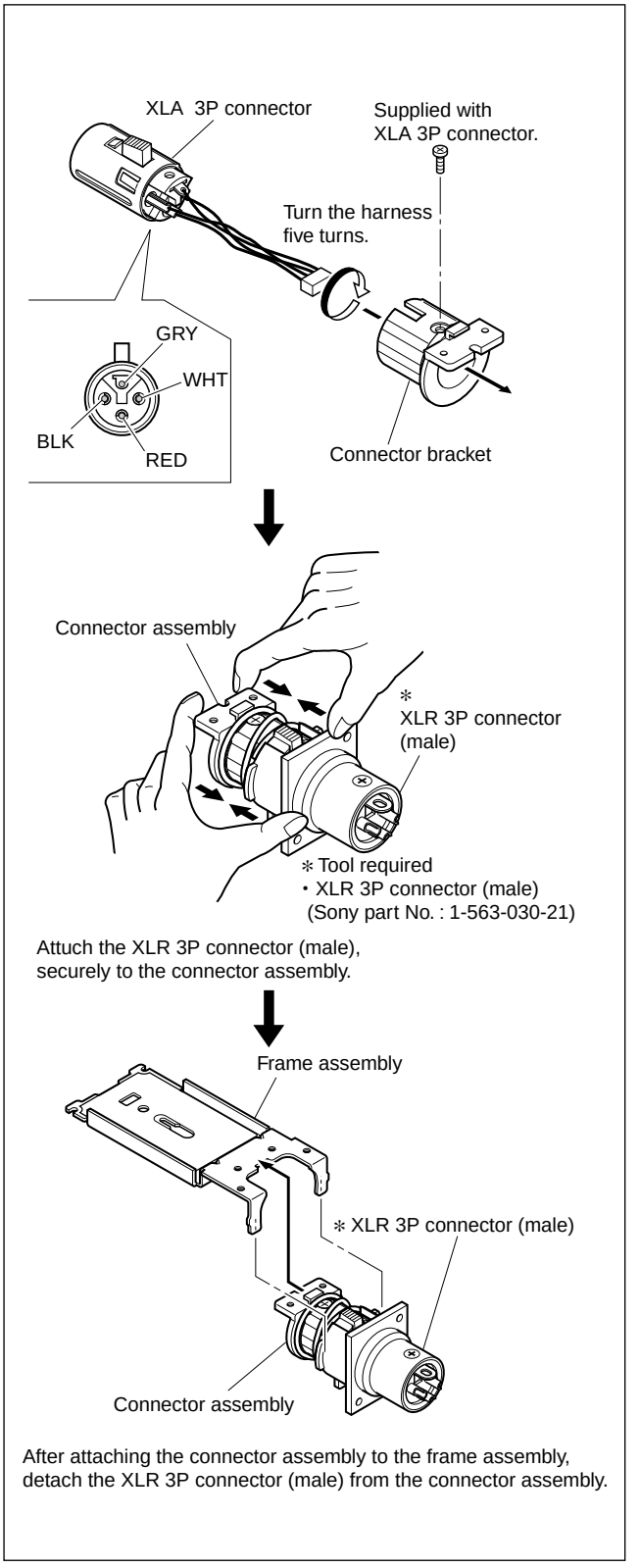


Frame assembly, XLA 3P connector

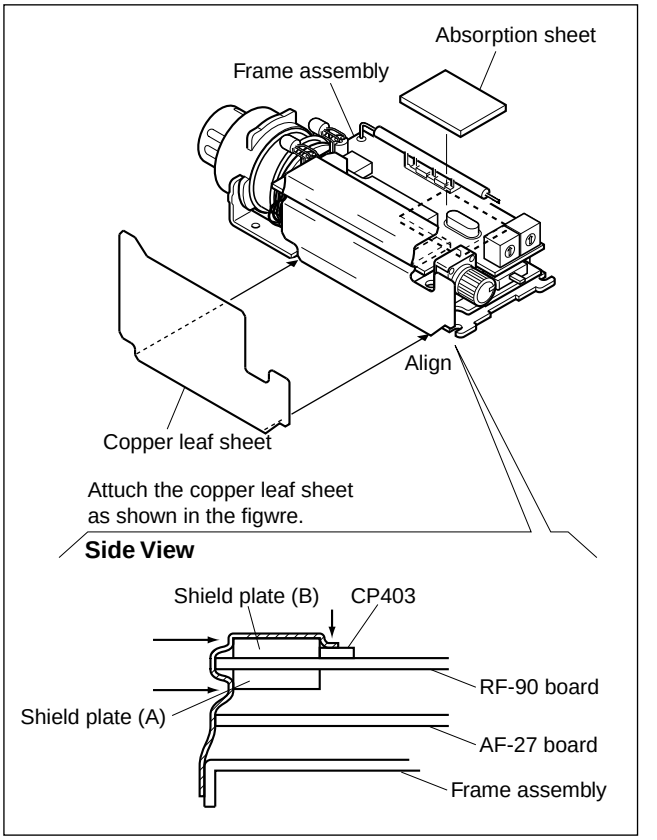


2-2. Note on Reassembly

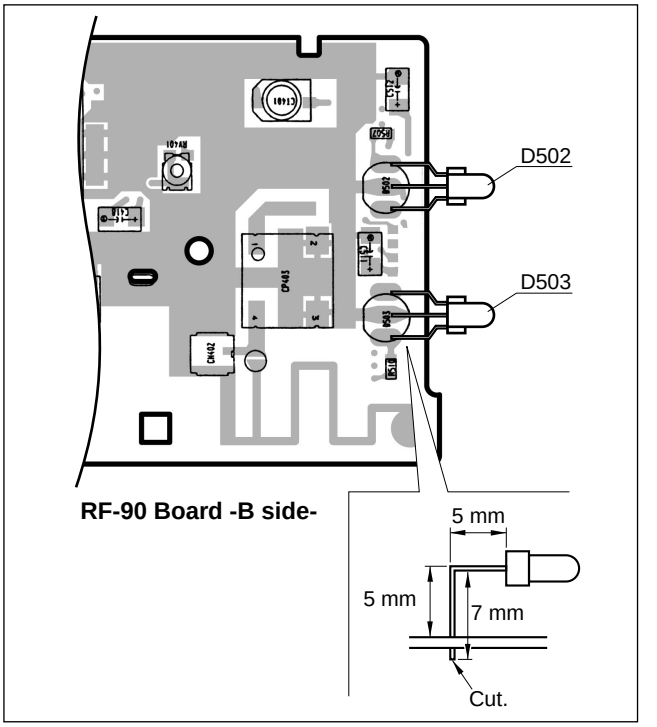
1. Connector Assembly



2. Copper leaf sheet, Absorption sheet



3. LED (D502, D503)



Section 3
Electrical Alignment

3-1. Equipment and Tools

Equipment Required

Name	Specifications	Model Name
DC Power Supply	Output regulated voltage: 0 to 5 V, 2 A	–
DC Ammeter	Measurement range: 300 mA	–
Spectrum Analyzer	Frequency: 10 kHz to 10 GHz	ADVANTEST R3371B or equivalent
Modulation Analyze	RF input Frequency: 150 kHz to 3 GHz	ANRITSU MS616A or equivalent
RF Power Meter with Power sensor	Range: 3 µW to 100 mW	HEWLETT PACKARD 435B (with Power sensor HEWLETT PACKARD 8482A) or equivalent
Audio Analyzer	Oscillator: 20 Hz to 100 kHz Distortion meter S/N meter Level meter	HEWLETT PACKARD 8903B (with A-weight filter) or equivalent
Frequency Counter	Frequency: 10 Hz to 1000 MHz Effective digits: 10 digits Resolution: 0.1 Hz	HEWLETT PACKARD 5385A or equivalent
Oscilloscope	Frequency: DC to 10 MHz	–
Digital Volt Meter	Effective digits: $3^{1}/_{2}$ digits	–

Tools Required

Name	Part No.	Remarks
MM-SMA (J) connector	J-6402-480-A	For RF signal output
SMA-BNC (J) connector	J-6402-490-A	For RF signal output
Adjustor (0.4 × 1.3 mm)	7-721-052-81	

3-2. Adjustments

This section describes the following adjustments and checks required to satisfy specifications.

Adjustment and Check Items

3-2-1. Power Supply Voltage Check
3-2-2. Carrier Frequency Adjustment
3-2-3. RF Power Output Adjustment
3-2-4. Reference Frequency Deviation Adjustment
3-2-5. Maximum Frequency Deviation Check
3-2-6. Distortion Ratio Check
3-2-7. Input Level Control Check
3-2-8. AF/PEAK and POWER/BATT Indicator Check
3-2-9. S/N Check
3-2-10. Frequency Characteristics Check
3-2-11. Tone Signal Adjustment
3-2-12. Battery Alarm Signal Check
3-2-13. Spurious Emissions Check
3-2-14. Occupied Bandwidth Check

Note

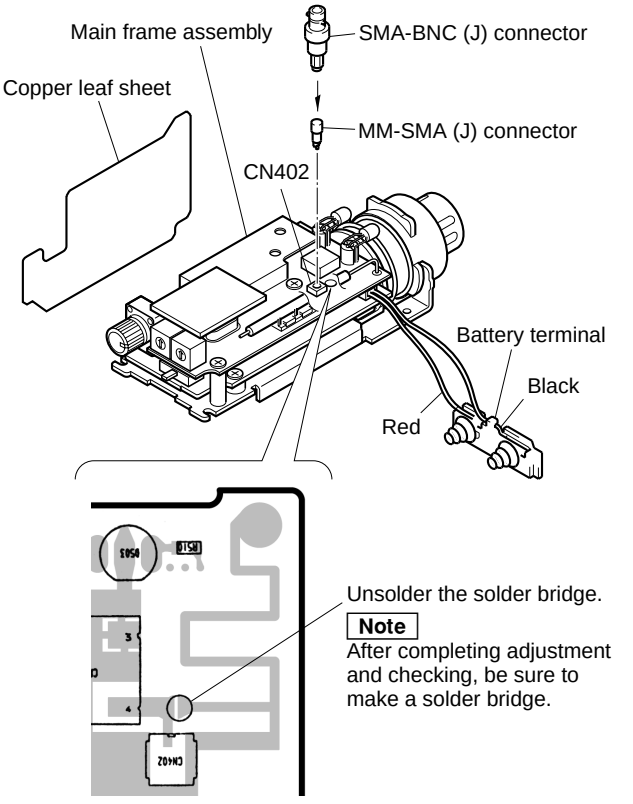
- 0 dBV = 1 Vrms
- 0 dBm = 0.775 Vrms

Preparation

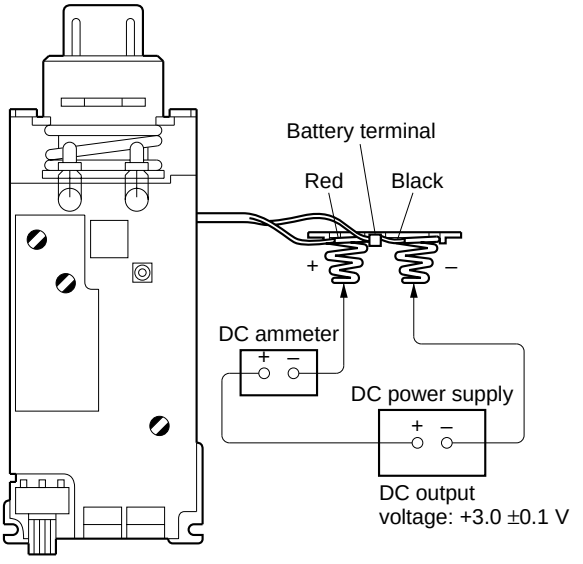
1. When adjustments are performed, remove the Main frame assembly (with battery terminal) from WRT-808A unit. Refer to the "Section 2. Service Overview" for removal.
2. Peel off the copper leaf sheet from the main frame assembly.
3. Connect the MM-SMA (J) connector (J-6402-480-A) with SMA-BNC (J) connector (J-6402-490-A) to the antenna connector (CN402) on the RF-90 board as shown below.
4. Unsolder the soldering bridge from the printed slit land on the RF-90 board as shown below.

   Note

   After completing adjustment and checking, be sure to make a solder bridge to the slit land.



5. Connecting the DC power supply.
   Supply the DC power to the battery terminal springs as shown below.

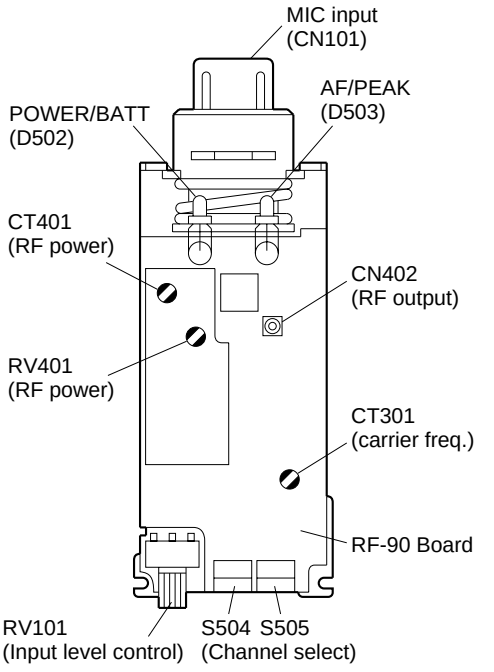


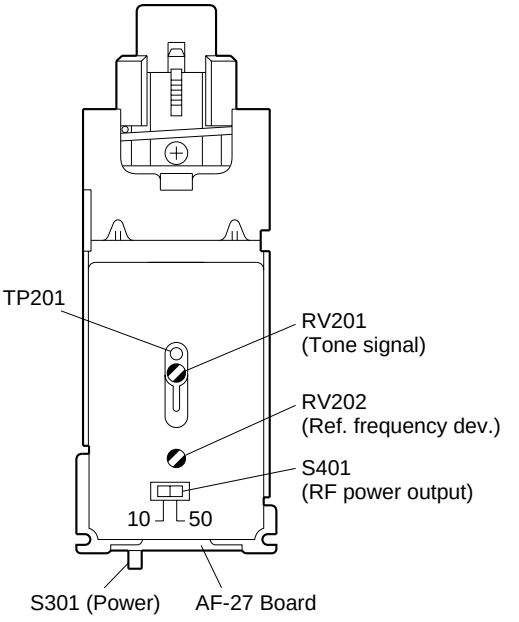
Check

After the DC power supply connection is completed, set the power switch (S301) to ON, and check the level on DC ammeter.

DC ammeter indication level: 160 to 200 mA

Adjustment Location





3-2-1. Power Supply Voltage Check

Equipment and Tools Required

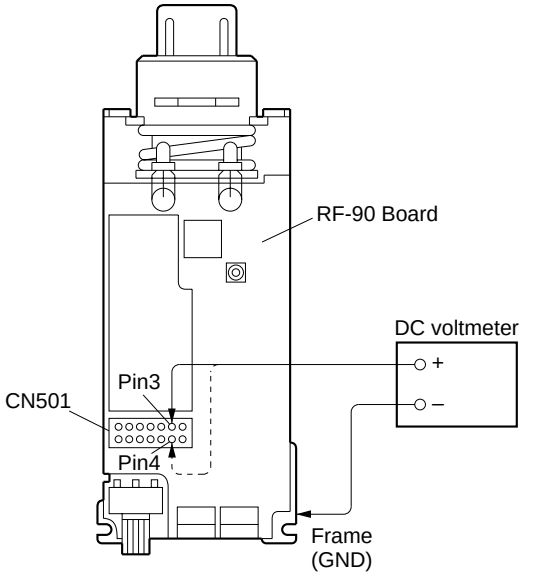
DC power supply
  DC output voltage: +3.0 ±0.1 V dc
DC ammeter
DC volt meter (or Digital multimeter)

Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).
Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)

Procedure

(1) Set the POWER switch (S301) on the AF-27 board to ON.
(2) Check the DC Voltage of the pin 3 or 4 of CN501 connector on the RF-90 board to the specified voltage as below:
  Specification: DC Voltage at pin 3 or 4 of CN501 connector
  = +5.0 ±0.1 V dc (For Vcc1)



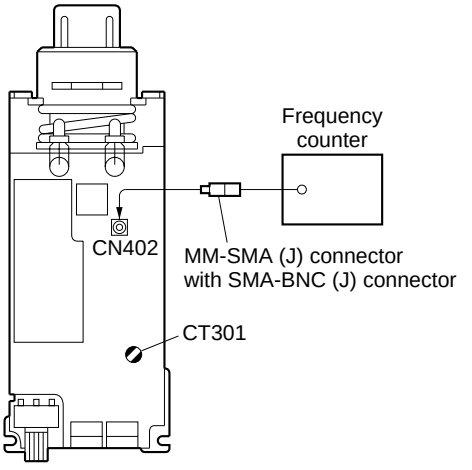
3-2-2. Carrier Frequency Adjustment

Equipment and Tools

DC power supply
  DC output voltage: +3.0 ±0.1 V dc
DC ammeter
Frequency counter
Adjustor (Part No. 7-721-052-81)
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Connections

(For connecting the DC power supply, refer to the "Preparations" on page 3-2.)



Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).
Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)

Procedure

(1) Connect the frequency counter to the antenna connector (CN301) with MM-SMA (J) and SMA-BNC (J) connectors.
(2) Adjust ⊘CT301 so that the frequency counter reading meets the following specification.
  Specification: Carrier frequency mentioned in the table below.

WRT-808A	Carrier frequency
U64 model	776.125 MHz ±1 kHz
U66 model	788.125 MHz ±1 kHz
U68 model	800.125 MHz ±1 kHz

Adjustment: ⊘CT301/RF-90 Board (B side)

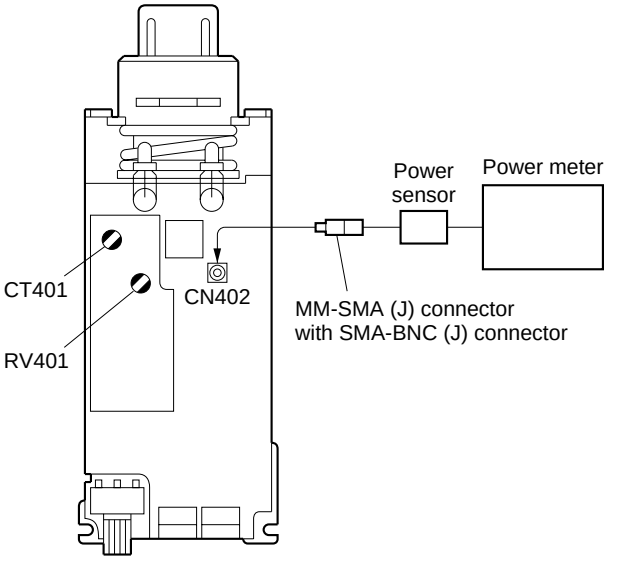
3-2-3. RF Power Output Adjustment

Equipment and Tools

DC power supply
  DC output voltage: +3.0 ±0.1 V dc
DC ammeter
Power meter (with power sensor)
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)
Adjustor (Part No. 7-721-052-81)

Connections

(For connecting the DC power supply, refer to the "Preparations" on page 3-2.)



Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).
Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)
RF power output switch (S401): 50 mW
Input LEVEL control (RV101): "−60" (0 dB attenuation)
  Turn the RV101 clockwise fully.

Procedure

(1) Connect the power meter (with power sensor) to the antenna connector (CN402) with MM-SMA (J) and SMA-BNC (J) connectors.
(2) Adjust ⊘CT401 so that the power meter reading meets the following specification.
  Specification: Power meter reading = Maximum
  Adjustment: ⊘CT401/RF-90 Board (B side)
(3) Adjust ⊘RV401 so that the power meter reading meets the following specification.
  Specification:
  Power meter reading = $50\ ^{+15}_{-10}$ mW
  Adjustment: ⊘RV401/RF-90 Board (B side)
(4) Set the RF output switch (S401) to the "10 mW" position, and check that the power meter reading meets the following specification.
  Specification: Power meter reading = 11 ±5 mW

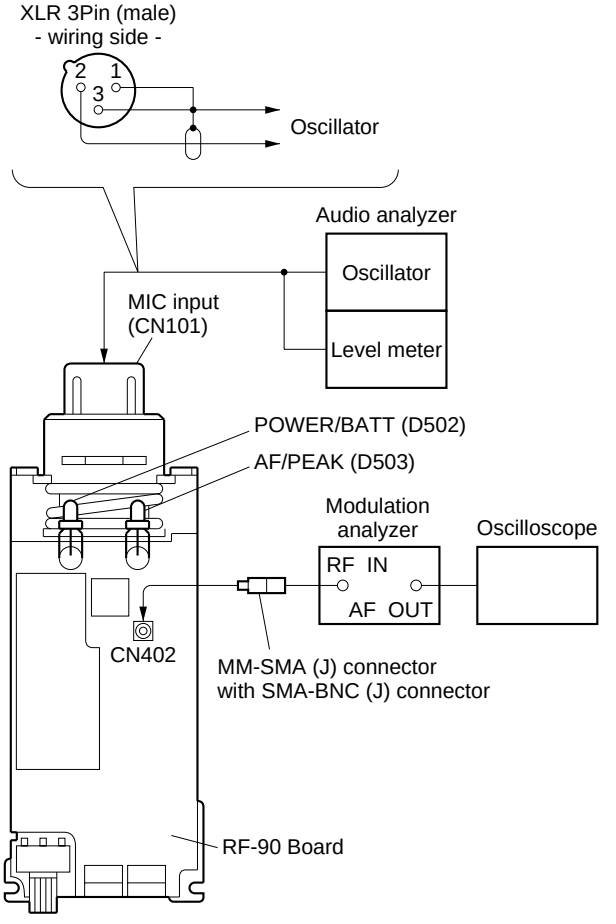
3-2-4. Reference Frequency Deviation Adjustment

Equipment and Tools

DC power supply
  DC output voltage: +3.0 ±0.1 Vdc
DC ammeter
Audio analyzer
Modulation analyzer
  MEASUREMENT: FM
  MEASUREMENT RANGE: AUTO or ±10 kHz
  HPF: 50 Hz
  LPF: 20 kHz or 15 kHz
  DE EMPHASIS: 50 µs
Adjustor (Part No. 7-721-052-81)
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Connections

(For connecting the DC power supply, refer to the "Preparations" on page 3-2.)



Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).

Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)
RF power output switch (S401): 50 mW
Input LEVEL control (RV101): "−60" (0 dB attenuation)
  Turn the RV101 clockwise fully.

Procedure

(1) Input 1 kHz, −60 dBV (−57.8 dBm) signal to the MIC input connector (CN101).
(2) Adjust ⊘RV202 so that the frequency deviation for the modulation analyzer reading meets the following specification.
  Specification: Frequency deviation
  = ±5 kHz ±0.1 kHz
  Adjustment: ⊘RV202/AF-27 Board (B side)

(3) After the adjustment has been completed, perform the "3-2-5. Maximum Frequency Deviation Check".

3-2-5. Maximum Frequency Deviation Check

Note

Be sure to perform this adjustment after "3-2-4. Reference Frequency Deviation Adjustment" has been completed.

Equipment and Tools

DC power supply
  DC output voltage: +3.0 ± 0.1 V dc
DC ammeter
Audio analyzer
Modulation analyzer
  MEASUREMENT: FM
  MEASUREMENT RANGE: AUTO or ± 100 kHz
  HPF: 50 Hz
  LPF: 15 kHz or 20 kHz
  DE EMPHASIS: 50 µs
Oscilloscope
Adjustor (Part No. 7-721-052-81)
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Connections

Same as "3-2-4. Reference Frequency Division adjustments".

Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).

Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)
RF power output switch (S401): 50 mW
Input LEVEL control (RV101): "−60" (0 dB attenuation)
  Turn the RV101 clockwise fully.

Procedure

(1) Input 1 kHz, −24dBV (−21.8 dBm) signal to the MIC input connector (CN101) with Mic input cable.
(2) Check that the frequency deviation for the modulation analyzer reading meets the following specification.
  Specification: Frequency deviation = ± 40 kHz ± 3 kHz

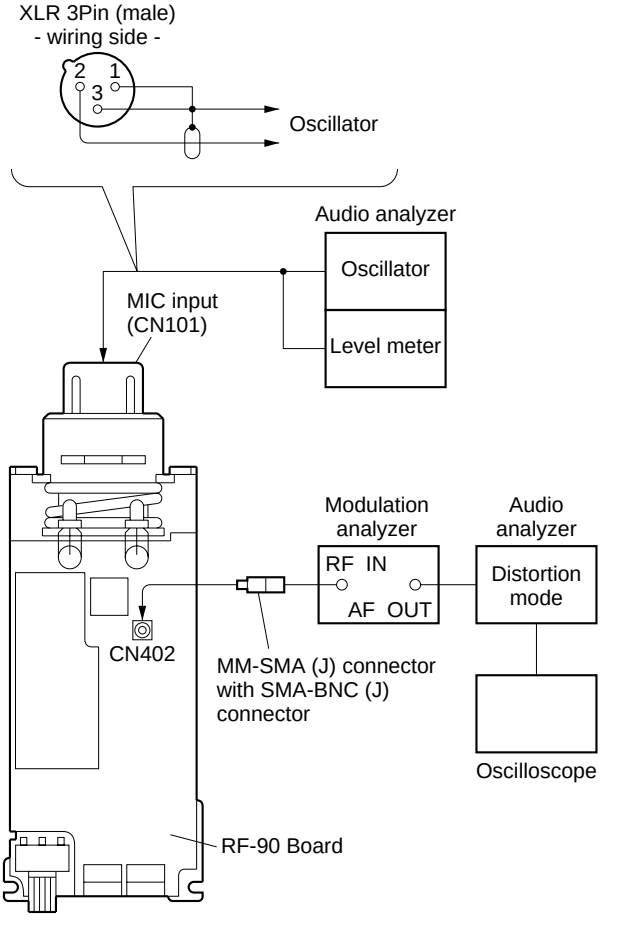
3-2-6. Distortion Ratio Check

Equipment and Tools

DC power supply
  DC output voltage: +3.0 ± 0.1 V dc
DC ammeter
Audio analyzer
Modulation analyzer
  MEASUREMENT: FM
  MEASUREMENT RANGE: AUTO or ± 40 kHz
  HPF: 50 Hz
  LPF: 15 kHz or 20 kHz
  DE EMPHASIS: 50 µs
Oscilloscope
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Connections

(For connecting the DC power supply, refer to the "preparations" on page 3-2.)



Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).

Transmitting Channel setting:
- U64 model: 65-01 channel (776.125 MHz)
- U66 model: 67-01 channel (788.125 MHz)
- U68 model: 69-01 channel (800.125 MHz)

RF power output switch (S401): 50 mW
Input LEVEL control (RV101): "−60" (0 dB attenuation) Turn the RV101 clockwise fully.

Procedure

(1) Connect the audio analyzer (distortion analyzer) to the AF OUT connector on the modulation analyzer.
(2) Set the audio analyzer to distortion measurement (distortion mode).
(3) Input 1 kHz, −60 dBV (−57.8 dBm) signal to the MIC input connector (CN101) from audio analyzer (oscillator).
(4) Check that the distortion analyzer reading is less than 0.90 %.
(5) Input 1 kHz, −24 dBV (−21.8 dBm) signal to the MIC input connector (CN101).
(6) Check that the distortion analyzer reading is less than 0.9 %.

3-2-7. Input Level Control Check

Equipment and Tools

DC power supply
  DC output Voltage: +3.0 ± 0.1 Vdc
DC ammeter
Audio analyzer
Modulation analyzer
  MEASUREMENT: FM
  MEASUREMENT RANGE: AUTO or ±40 kHz
  HPF: 50 Hz
  LPF: 15 kHz or 20 kHz
  DE EMPHASIS: 50 μs
Oscilloscope
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Connections

Same as "3-2-6. Distortion Ratio Check".

Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).

Transmitting Channel setting:
- U64 model: 65-01 channel (776.125 MHz)
- U66 model: 67-01 channel (788.125 MHz)
- U68 model: 69-01 channel (800.125 MHz)

RF power output switch (S401): 50 mW
Input LEVEL control (RV101):
"−60"(0 dB attenuation) Turn the RV101 clockwise fully.

Procedure

(1) Connect the audio analyzer (level meter) to the AF OUT connector on the modulation analyzer.
(2) Set the audio analyzer to level meter mode.
(3) Input 1 kHz, −60 dBV (−57.8 dBm) signal to the MIC input connector (CN101) from audio analyzer (oscillator).
(4) Reads the indication on the audio analyzer (level meter).
(5) Set the SENSITIVITY on the audio analyzer (level meter) so that the audio analyzer (level meter) reads 0 dB.
(6) Turn the RV101 (Input LEVEL control) counterclockwise fully.
(7) Check that audio analyzer (level meter) reading is $-26\,^{+2}_{-1}$ dB. (Indication level is $-26\,^{+2}_{-1}$ dB as compared with the read level of procedure (5) above.)

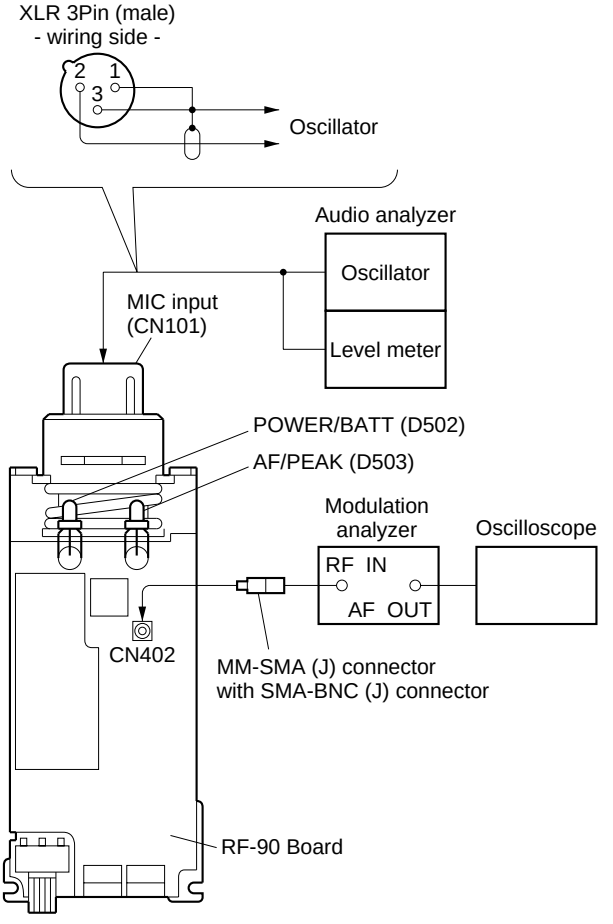
3-2-8. AF/PEAK and POWER/BATT Indicators Check

Equipment and Tools

DC power supply
  DC output Voltage: +3.0 ±0.1 Vdc
DC ammeter
Audio analyzer
Modulation analyzer
  MEASUREMENT: FM
  MEASUREMENT RANGE: AUTO or ± 10 kHz
  HPF: 50 Hz
  LPF: 15 kHz or 20 kHz
  DE EMPHASIS: 50 µs
Oscilloscope
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Connections

(For connecting the DC power supply, refer to the "preparations" on page 3-2.)



Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).

Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)
RF power output switch (S401): 50 mW
Input LEVEL control (RV101): "−60" (0 dB attenuation)
  Turn the RV101 clockwise fully.

Procedure

- **AF/PEAK indicator check**

(1) Connect the audio analyzer (oscillator) to the MIC input connector (CN101).
(2) Increase gradually the output level from the audio analyzer (oscillator), and check that the output level of the oscillator is as follows when the AF/PEAK indicator LED (D503) lights.

AF/PEAK indicator LED (D503)	Audio analyzer(oscillator) (MIC input connector input level)
Goes out.	Less than −60 dBV (−57.8 dBm) ±2.0 dB
Lights in green	More than or equal to −60 dBV (−57.8 dBm) ±2.0 dB
Lights in red	More than or equal to −24 dBV (−21.8 dBm) ±2.0 dB

- **POWER/BATT indicator check**

(1) Decrease gradually the DC output level of the DC regulated power supply from 3.0 V, and check that the DC output level of the DC regulated power supply is as follows when the POWER/BATT indicator LED(D502) lights.

POWER/BATT indicator LED (D502)	DC power supply voltage of DC regulated power supply
Lights in green.	More than or equal to 2.1 V (Less than 3.0 V)
Lights in red.	Less than or equal to 2.0 V ±0.1 V
Flashing in red	Less than or equal to 1.8 V ±0.2 V
Goes out.	Less than or equal to 1.2 V ±0.2 V

3-2-9. S/N Check

Equipment and Tools

DC power supply
  DC output Voltage: +3.0 ±0.1 V dc
DC ammeter
Audio analyzer
Modulation analyzer
  MEASUREMENT: FM
  MEASUREMENT RANGE: ±40 kHz
  HPF: 50 Hz
  LPF: 15 kHz for HEWLETT PACKARD equipment
  20 kHz for ANRITSU equipment
  DE EMPHASIS: 50 µs
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Connections

Same as "3-2-6. Distortion Ratio Check".

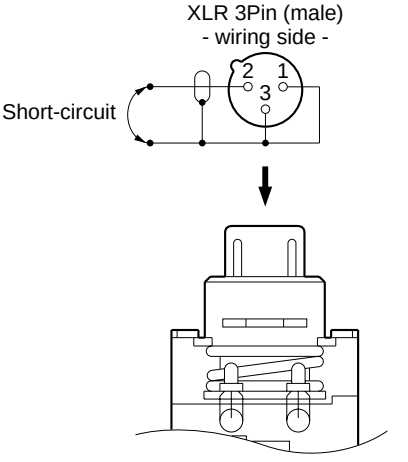
Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).

Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)
RF power output switch (S401): 50 mW
Input LEVEL control (RV101): "−60" (0 dB attenuation)
  Turn the RV101 clockwise fully.

Procedure

(1) Connect the audio analyzer (level meter) to the AF OUT connector on the modulation analyzer.
(2) Input 1 kHz, −60 dBV (−57.8 dBm) signal to the MIC input connector (CN101) from audio analyzer (oscillator).
(3) Set the audio analyzer to S/N measurement (with A-weighted filter).
(4) Check that the S/N reading is more than 32dB. (with MIC input connector short-circuited).



3-2-10. Frequency Characteristics Check

Equipment and Tools

DC power supply
  DC output Voltage: +3.0 ±0.1 V dc
DC ammeter
Audio analyzer
Modulation analyzer
  MEASUREMENT: FM
  MEASUREMENT RANGE: ±40 kHz
  HPF: OFF
  LPF: OFF
  DE EMPHASIS: 50 µs
Oscilloscope
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Connections

Same as "3-2-6. Distortion Ratio Check".

Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).

Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)
RF power output switch (S401): 50 mW
Input LEVEL control (RV101): "−60" (0 dB attenuation)
  Turn the RV101 clockwise fully.

Procedure

(1) Connect the audio analyzer (level meter) to the AF OUT connector for the modulation analyzer.
(2) Set the audio analyzer to level meter mode.
(3) Input 1 kHz, −60 dBV (−57.8 dBm) signal to the Mic input connector (CN101) from audio analyzer (oscillator).
(4) Reads the indication on the audio analyzer (level meter) .
(5) Set the SENSITIVITY on the audio analyzer (level meter) so that the audio analyzer (level meter) reads 0 dB.
(6) Switch the oscillation frequency for the audio analyzer (oscillator) from 1 kHz to 100 Hz.
(7) Check that audio analyzer (level meter) reading is 0 ± 1.0 dB.
(8) Next, switch the oscillation frequency for the audio analyzer (oscillator) from 100 Hz to 10 kHz.
(9) Check that the reading for the audio analyzer (level meter) is −1.0 ±1.0 dB.

3-2-11. Tone Signal Adjustment

Equipment and Tools

DC power supply
  DC output Voltage: +3.0 ±0.1 V dc
DC ammeter
Frequency counter
Spectrum analyzer
Modulation analyzer
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Switch and Control Setting

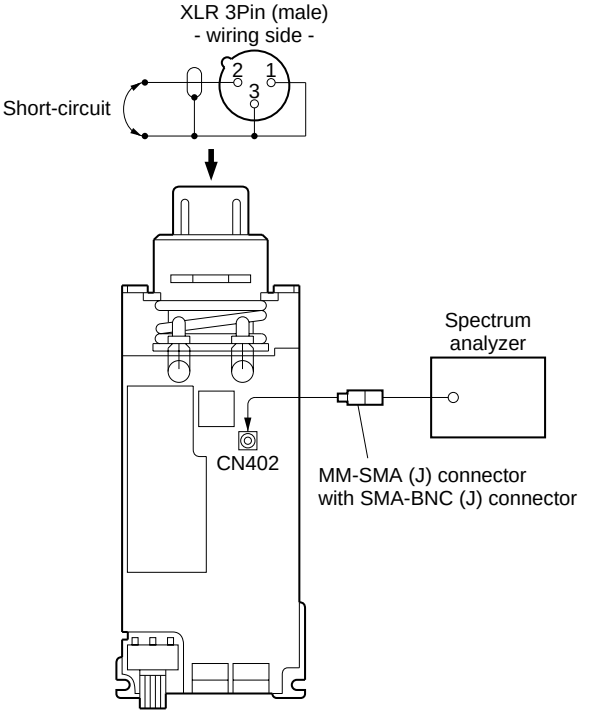
The following setting is to be perform with the channel select switches (S504 and S505).

Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)
RF power output switch (S401): 50 mW
Input LEVEL control (RV101): "−60" (0 dB attenuation)
  Turn the RV101 clockwise fully.

1. Frequency deviation adjustment

Connections

(For connecting the DC power supply, refer to the "Preparations" on page 3-2.)



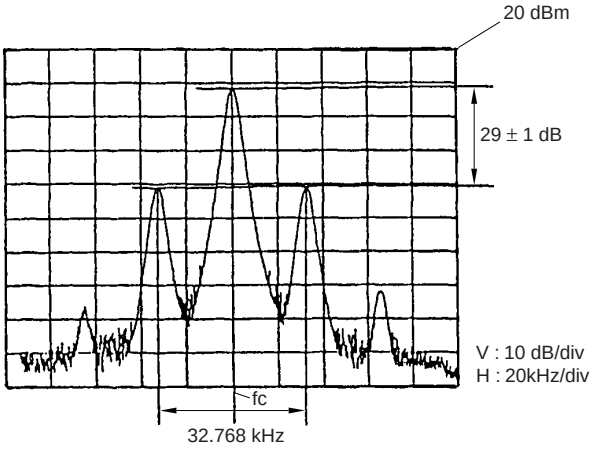
Procedure

Note

Perform the checking with the Mic input connector (CN101) short-circuit.

(1) Set the spectrum analyzer as follows:
CENTER FREQUENCY (fc):
U64 model: 776.125 MHz
U66 model: 788.125 MHz
U68 model: 800.125 MHz
REFERENCE LEVEL: 20 dBm
FREQUENCY SPAN: 200 kHz (20 kHz/DIV)
RBW (resolution band width): 3 kHz
VBW (video band width): 1 kHz
ATT: 20 dB

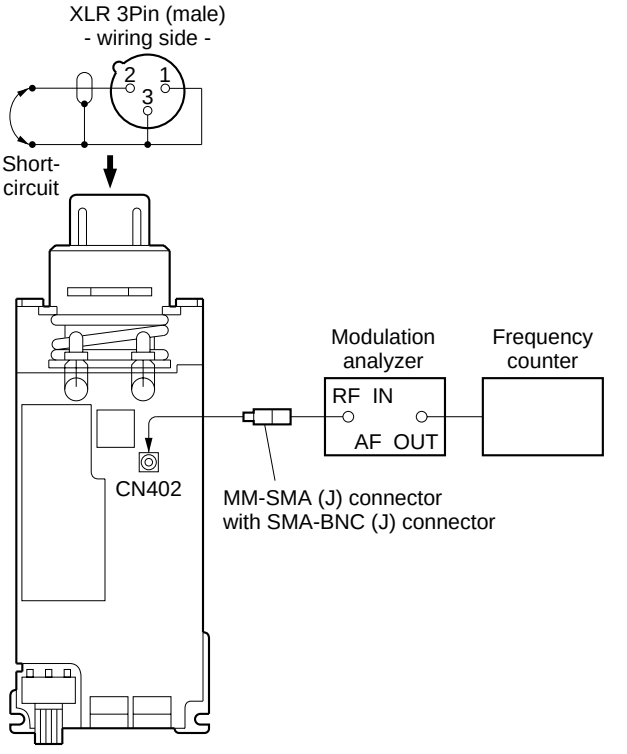
(2) Adjust ⊘RV201 so that level between carrier frequency (frequency center level) on spectrum analyzer and tone signal is within 29 dB ± 1 dB.



2. Frequency check

Connections

(For connecting the DC power supply, refer to the “Preparations” on page 3-2.)



Procedure

Note

Perform the checking with the Mic input connector (CN101) short-circuit.

(1) Set the modulation analyzer as follows:
MEASUREMENT: FM
MEASUREMENT RANGE: ±40 kHz
HPF: 4 kHz
LPF: >20 kHz
DE EMPHASIS: OFF

(2) Check that the frequency counter (resolution : 0.1 Hz setting) reading is 32.768 kHz ± 1 Hz.

3-2-12. Battery Alarm Signal Check

Equipment and Tools

DC power supply
  DC output Voltage: +3.0 ±0.1 V dc
DC ammeter
Frequency counter
Spectrum analyzer
Modulation analyzer
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Switch and Control Setting

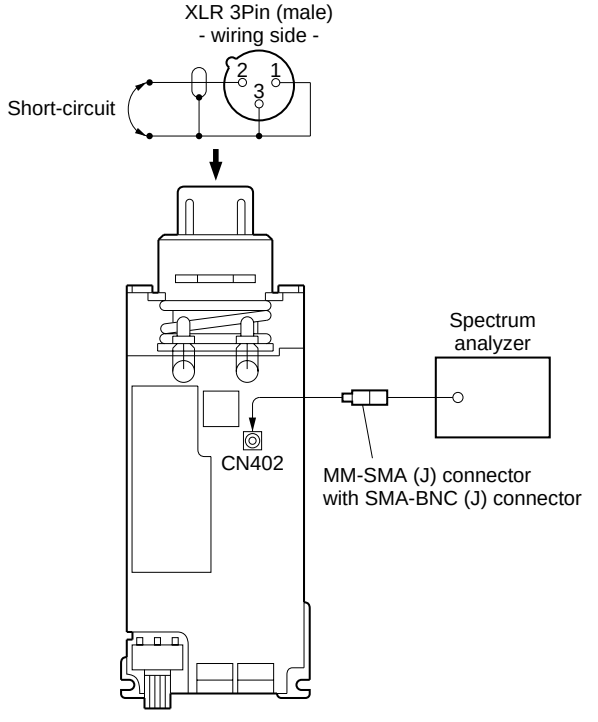
The following setting is to be perform with the channel select switches (S504 and S505).

Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)
RF power output switch (S401): 50 mW
Input LEVEL control (RV101): "−60" (0 dB attenuation)
  Turn the RV101 clockwise fully.

1. Frequency deviation check

Connections

(For connecting the DC power supply, refer to the "Preparations" on page 3-2.)

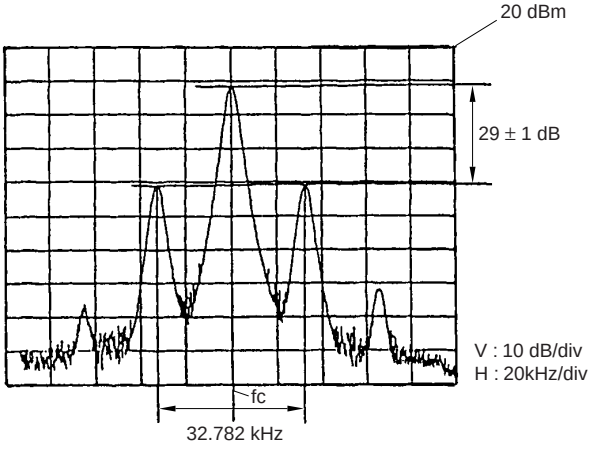


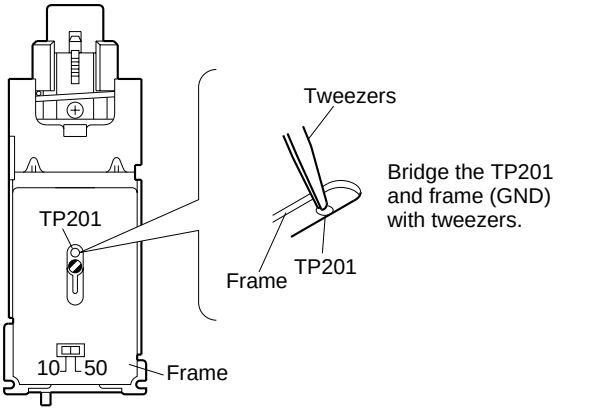
Procedure

Note

Perform the checking with the MIC input connector (CN101) short-circuited.

(1) Set the spectrum analyzer as follow:
  CENTER FREQUENCY (fc):
    U64 model: 776.125 MHz
    U66 model: 788.125 MHz
    U68 model: 800.125 MHz
  REFERENCE LEVEL: 20 dBm
  FREQUENCY SPAN: 200 kHz (20 kHz/DIV)
  RBW (resolution band width): 3 kHz
  VBW (video band width): 1 kHz
  ATT: 20 dB
(2) Decrease gradually the DC output voltage of the DC regulated power supply and confirm that the battery alarm signal turns on at 2.0 ±0.1 V.
(3) While the TP201 is short-circuited to the frame (GND) with a tweezers etc (TONE signal ; OFF), check that level difference between carrier frequency (center frequency level) on spectrum analyzer and tone signal is with in 29 ±1 dB.

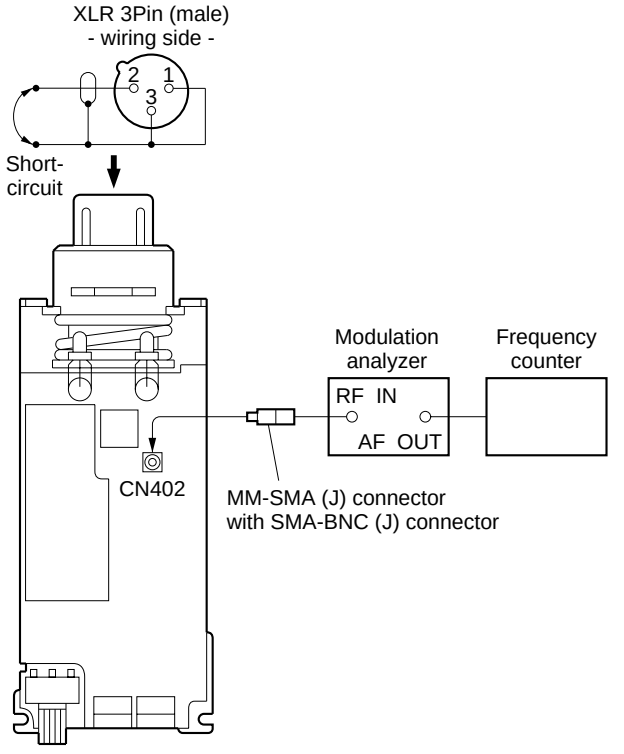




2. Frequency check

Connections

(For connecting the DC power supply, refer to the “Preparations” on page 3-2.)



Procedure

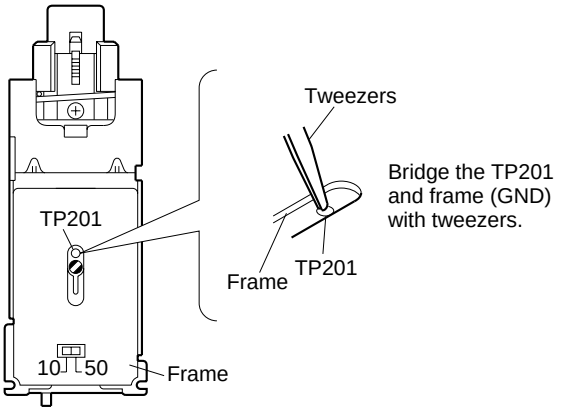
Note

Perform the checking with the MIC input connector (CN101) short-circuited.

(1) Set the modulation analyzer as follows:
MEASUREMENT: FM
MEASUREMENT RANGE: ±40 kHz
HPF: 4 kHz
LPF: >20 kHz
DE EMPHASIS: OFF

(2) Set the DC output voltage of DC power supply to 2.0 ± 0.1 V so that battery alarm signal goes on.

(3) While the TP201 is short-circuited to the frame (GND) with a tweezers etc (TONE signal ; OFF), check that frequency counter (resolution:0.1 Hz) reading is 32.782 kHz ± 1 Hz.



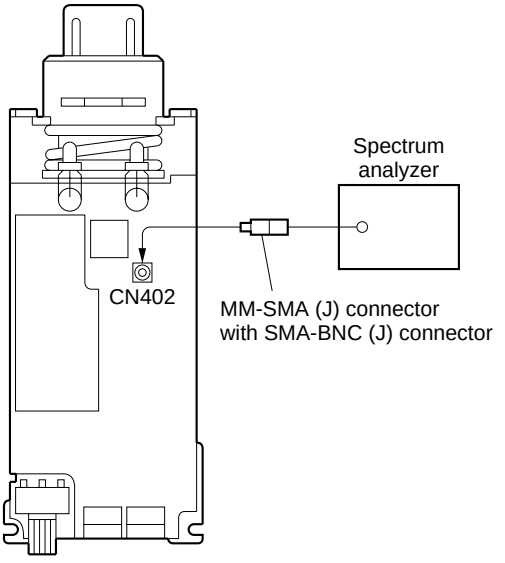
3-2-13. Spurious Emissions Check

Equipment and Tools

DC power supply
  DC output Voltage: +3.0 ±0.1 V dc
DC ammeter
Spectrum analyzer
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Connections

(For connecting the DC power supply, refer to the "Preparations" on page 3-2.)



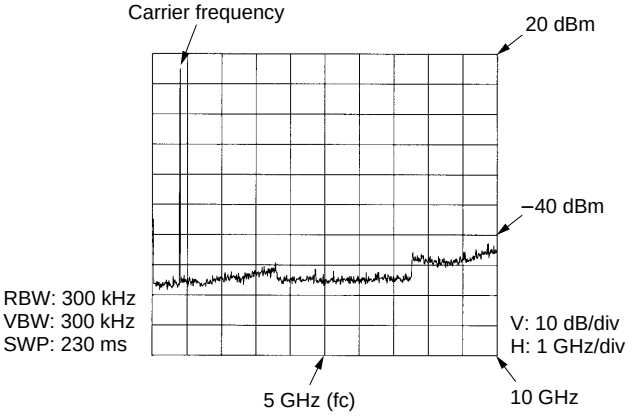
Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).

Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)
RF power output switch (S401): 50 mW
Input LEVEL control (RV101): "−60" (0 dB attenuation)
  Turn the RV101 clockwise fully.

Procedure

(1) Set the spectrum analyzer as follows;
  CENTER FREQUENCY: 5.0 GHz
  REFERENCE LEVEL: 20 dBm
  FREQUENCY SPAN: 10 GHz (1 GHz/DIV)
  RBW (resolution band width): 300 kHz
  ATT: 30 dB
(2) Check that the spurious emissions level (up to tenth order) reading for the spectrum analyzer remains below −40 dBm.

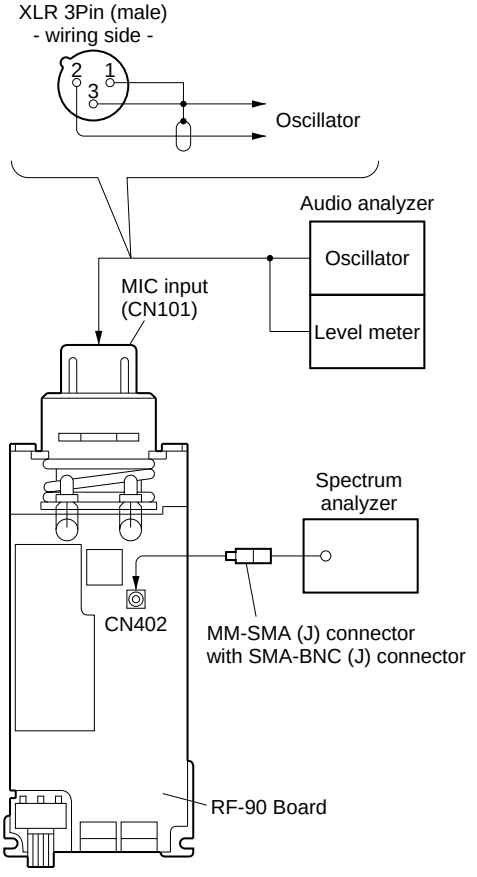


3-2-14. Occupied Band Width Check

Equipment and Tools

DC power supply
  DC output Voltage: +3.0 ±0.1 Vdc
DC ammeter
Audio analyzer
Spectrum analyzer
MM-SMA (J) connector (Part No. J-6402-480-A)
SMA-BNC (J) connector (Part No. J-6402-490-A)

Connections



Switch and Control Setting

The following setting is to be perform with the channel select switches (S504 and S505).

Transmitting Channel setting:
  U64 model: 65-01 channel (776.125 MHz)
  U66 model: 67-01 channel (788.125 MHz)
  U68 model: 69-01 channel (800.125 MHz)
RF power output switch(S401): 50 mW
Input LEVEL control (RV101): "−60" (0 dB attenuation)
  Turn the RV101 clockwise fully.

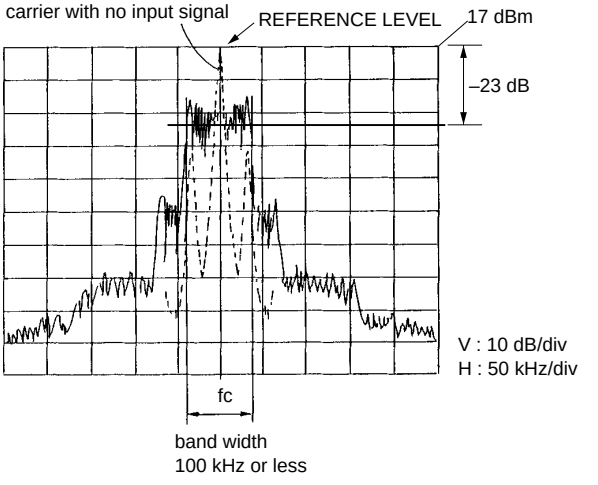
Procedure

(1) Set the spectrum analyzer as below:
  CENTER FREQUENCY:
    U64 model: 776.125 MHz ±1 kHz
    U66 model: 788.125 MHz ±1 kHz
    U68 model: 800.125 MHz ±1 kHz
  REFERENCE LEVEL: 17 dBm
  FREQUENCY SPAN: 500 kHz (50 kHz/DIV)
  RBW (resolution band width): 1 kHz
  VBW (video band width): 1 kHz
  ATT: 30 dB

(2) Set the carrier frequency level (the center frequency level of the spectrum analyzer) to the REFERENCE LEVEL (17 dBm) when no signals are input.

(3) Input 1 kHz, −24 dBV (−21.8 dBm) signal to the MIC input connector (CN101) from audio analyzer (oscillator), and you can see the waveform which has some bandwidth as shown below.

(4) At this time, check that the bandwidth at the level 23 dB lower than REFERENCE LEVEL is in specification.
  Specification: Bandwidth = 100 kHz or less



Section 4
Semiconductor Pin Assignments

The semiconductors in the manual are listed by equivalent types. Thus the external view or the index mark indication may differ from the actual type.
In some cases incompatible types are also listed, therefore, when a part is to be replaced, also refer to the Spare Parts section.
Pin assignments and block diagrams are based on the IC manufacturer's data book.

ここに記載されている半導体は，それぞれの機能を等価的に表わしたものです。
外観やインデックスマークの表示方法が実物と異なる場合があります。
なお，互換性のない型名を併記している場合がありますので，部品を交換するときは，Spare Partsの章を参照してください。
ピン配置およびブロック図はICメーカーのデータブックに従いました。

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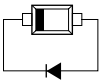
TC7WU04FU(TE12R) 4-4

Diode, LED, Transistor

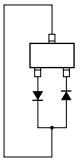
DIODE

—TOP VIEW—



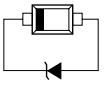
1SS367-T3SONY

—TOP VIEW—



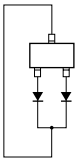
MA133 (MATSUSHITA)
MA133-TX

—TOP VIEW—



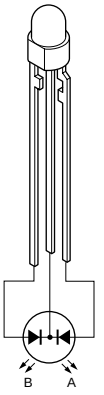
RD9.1SB
RD9.1SB-T1

—TOP VIEW—



UMZ8.2T
UMZ8.2T-T106

LED

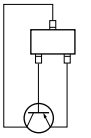


SPR-39MVWFMN

A : RED
B : GREEN

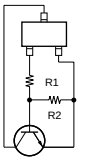
TRANSISTOR

—TOP VIEW—



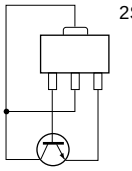
2SA1965-TL

—TOP VIEW—



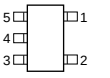
DTC143ZE
(R1=4.7 k,R2=47 k)
DTC143ZE-TL

—TOP VIEW—

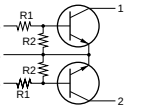


2SC3607-TE12L

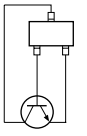
—TOP VIEW—



UMG8-TL
(R1=4.7 k,R2=47 k)
UMG8-TR

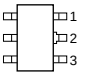


—TOP VIEW—

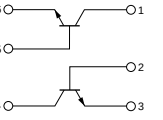


2SC4738-YGR-TE85L
2SC4919
2SC4919-TL
2SD2216-Q (TOSHIBA)
FMMT617TA

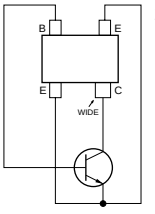
—TOP VIEW—



XN4504
XN4504-TX

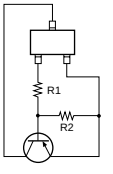


—TOP VIEW—



2SC5015-T1

—TOP VIEW—

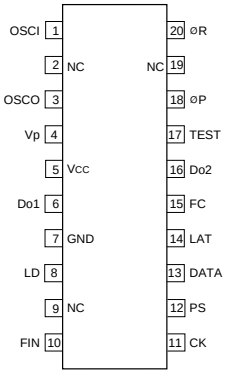


DTA144EE
DTA144EE-TL

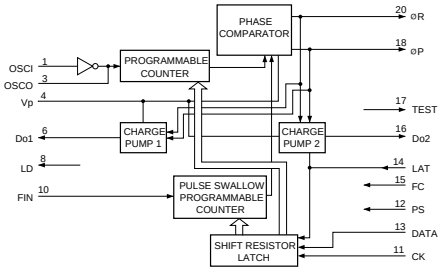
IC

CXA1786N-T4 (SONY)

PLL FREQUENCY SYNTHESIZER (1.1 GHz BAND)
—TOP VIEW—

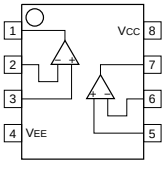


OSCI : REFERENCE FREQUENCY INPUT
OSCO : REFERENCE FREQUENCY OUTPUT
Vp : POWER SUPPLY FOR CHARGE PUMP, PHASE COMPARATOR
Do1 : CHARGE PUMP 1 OUTPUT
Do2 : CHARGE PUMP 2 OUTPUT
LD : LOCK DETECTION SIGNAL OUTPUT
øP : PHASE COMPARATOR OUTPUT
øR : PHASE COMPARATOR OUTPUT
CK : CLOCK INPUT
DATA : DATA INPUT
LAT : LATCH INPUT
PS : POWER SAVE INPUT ("L" : POWER SAVE MODE)
FC : SELECTION TERMINAL FOR PHASE OF PHASE COMPARATOR OUTPUT AND COUNTER OUTPUT SIGNAL TO TEST TERMINAL
TEST : OUTPUT FOR DIVIDING SIGNAL OF COUNTER



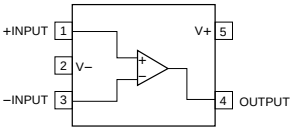
MC33077DR2 (MOTOROLA)

DUAL OPERATIONAL AMPLIFIERS
(DUAL-SUPPLY TYPE)
—TOP VIEW—



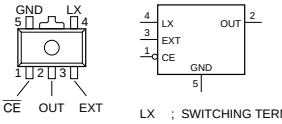
NJM2107F (JRC)
NJM2107F-TE2

SINGLE OPERATIONAL AMPLIFIER
—TOP VIEW—

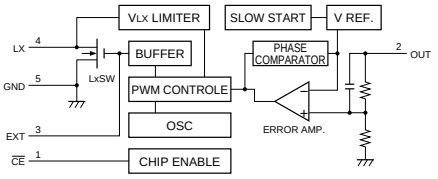


RH5RH503B-T1

C-MOS PWM STEP-UP DC/DC CONVERTER
—TOP VIEW—

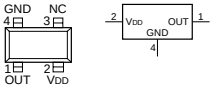


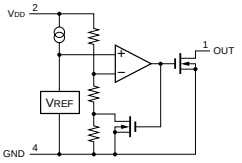
LX ; SWITCHING TERMINAL (OPEN DRAIN)
EXT ; EXTERNAL TRANSISTOR DRIVE (CMOS OUTPUT)
$\overline{CE}$; CHIP ENABLE
OUT ; STEP-UP OUTPUT VOLTAGE MONITOR



S-80845ALNP-EA9-T2 (SEIKO INSTR)+4.5 V

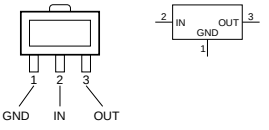
VOLTAGE DETECTOR
—TOP VIEW—





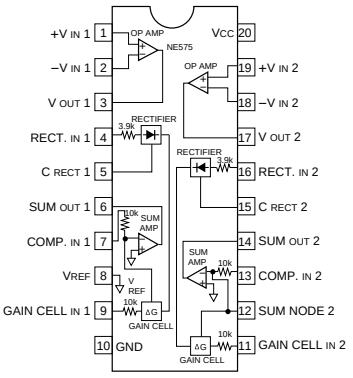
S-81233SGUP-DQF-T1 (SEIKO I&E)

POSITIVE VOLTAGE REGULATOR
—TOP VIEW—



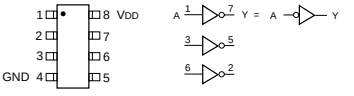
SA575DK-T (PHILIPS)

LOW VOLTAGE COMPANDOR
—TOP VIEW—



TC7WU04FU(TE12R) (TOSHIBA)

TRIPLE INVERTERS
—TOP VIEW—



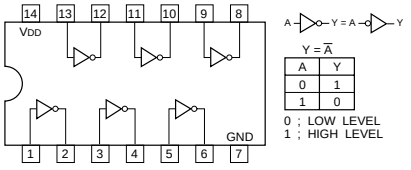
$Y = \overline{A}$

A	Y
0	1
1	0

0 : LOW LEVEL
1 : HIGH LEVEL

TC4069UBFT(EL,N) (TOSHIBA)

C-MOS INVERTER
—TOP VIEW—



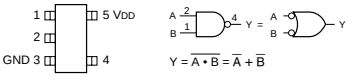
$Y = \overline{A}$

A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL

TC4S11F (TOSHIBA)
TC4S11F(TE85R)

C-MOS 2-INPUT NAND GATE
—TOP VIEW—



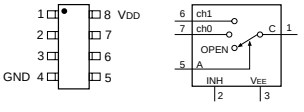
$Y = \overline{A \cdot B} = \overline{A} + \overline{B}$

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

0 : LOW LEVEL
1 : HIGH LEVEL

TC4W53FU (TOSHIBA)
TC4W53FU(TE12R)

C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER
—TOP VIEW—

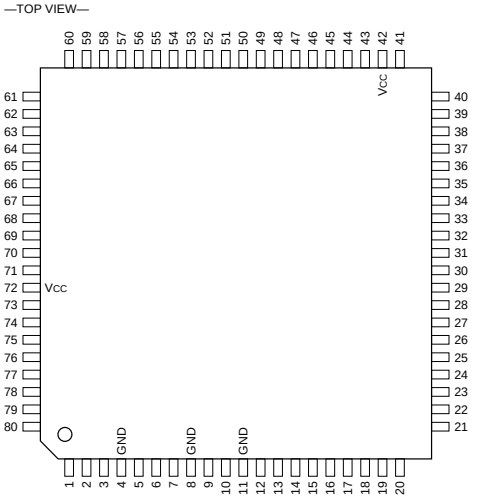


CONT. INPUT		ON
INH	A	CHANNEL
0	0	ch0
0	1	ch1
1	×	OPEN

0 : LOW LEVEL
1 : HIGH LEVEL
× : DON'T CARE

CPU Pin Description : IC501

HD6473644W



Pin No.	Signal Name	I/O	Description
2	ALO	IN	Audio Level Indicator (Ref.)
3	—	IN	Setting Destination
4	AVss	—	Ground
5	—	—	Ground
7	X1	IN	Clock Input (32.768 kHz)
8	Vss1	—	Ground
9	Osc1	IN	Clock Input (4.0 MHz)
11	Vss2	—	Ground
12	RES	IN	Reset (L: reset)
13	—	—	Ground
14	—	—	Ground
15	—	—	Ground
17	—	—	Ground
18	—	—	Ground
19	IRQ0	—	Power supply (+5 V)
22	TV-1	IN	TV SW-1
23	TV-2	IN	TV SW-2
24	TV-4	IN	TV SW-4
25	TV-8	IN	TV SW-8
26	CH-1	IN	CH SW-1
27	CH-2	IN	CH SW-2
28	CH-4	IN	CH SW-4
29	CH-8	IN	CH SW-8

Pin No.	Signal Name	I/O	Description
38	TEST	IN	TEST (L: test)
42	Vcc	IN	Power supply (+5 V)
49	AFM	OUT	Audio Mute Cntrol (Mute on: H)
50	ID	—	—
51	LVD	OUT	Battery Alarm On/Off (On: H)
52	Poff	IN	Power off detection (Off: L)
54	LEDAR	OUT	Audio Peek Level Ind. (Red On: L)
55	LEDAG	OUT	Audio Reference Level Ind. (Green On: L)
56	LEDBT	OUT	Battery Ind. (Red On: L)
57	LED	OUT	Power Ind. (Green On: L)
59	—	—	Ground
64	CK	OUT	Clock for PLL
65	LAT	OUT	PLL latch
66	RFM	OUT	RF Mute Control (Mute on: H)
68	LD	IN	Lock detection for PLL (Lock: L)
70	DATA	OUT	Data for PLL
72	Avcc	IN	Power supply (+5 V)
73	APO	IN	Audio Level Indicator (Peek)
75	—	IN	Setting destination
76	—	IN	Setting destination
77	—	IN	Setting destination
78	BAT	IN	Battery detection

NC: 1, 6, 10, 16, 20, 21, 30 to 37, 39 to 41, 43 to 48, 53, 58, 60 to 63, 67, 69, 71, 74, 79, 80

Section 5
Spare Parts

5-1. Notes on Repair Parts

1. Safety Related Components Warning

WARNING

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

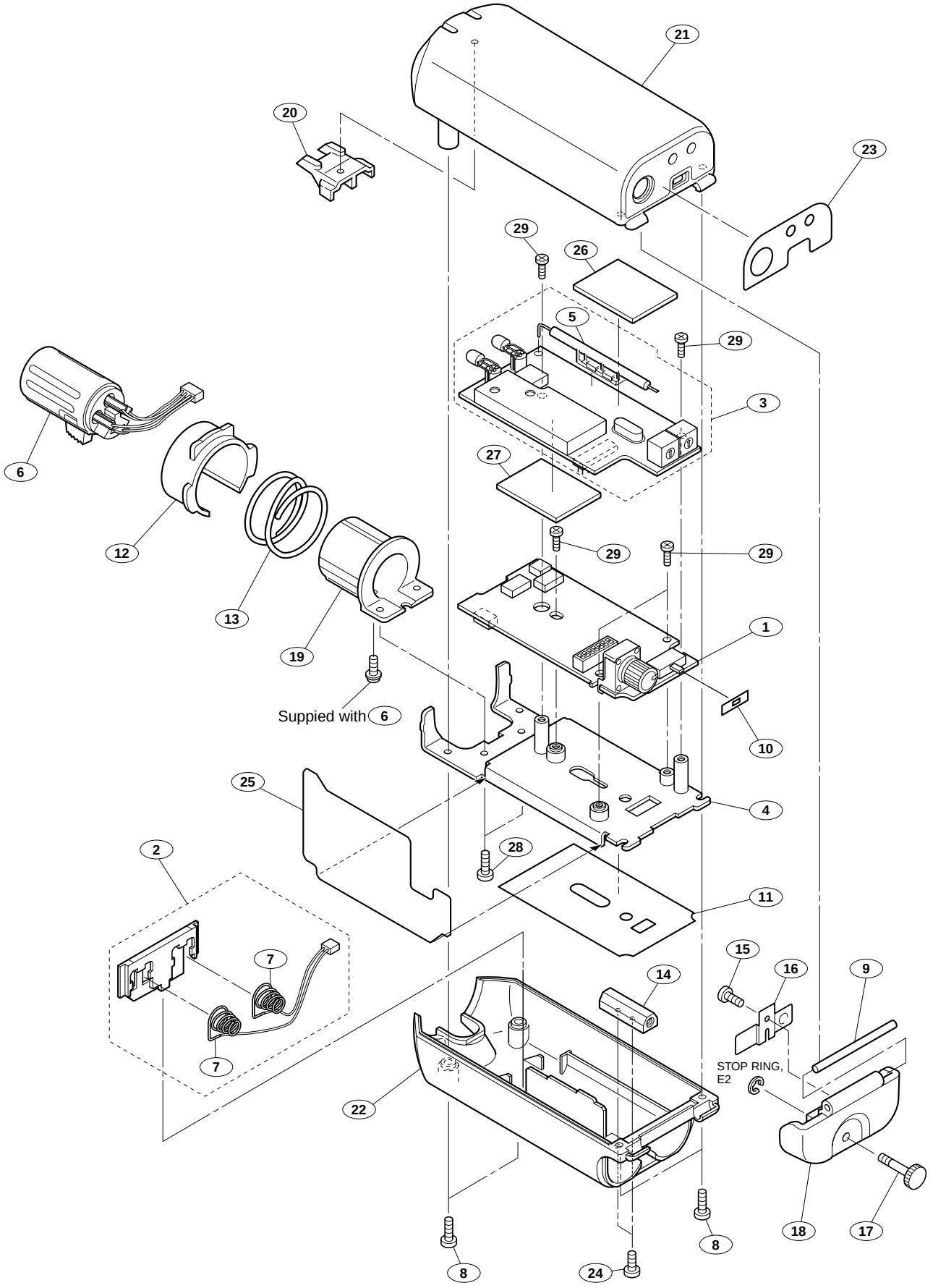
Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

3. Stock of Parts

Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

5-2. Exploded Views

No.	Part No.	SP	Description
1	A-8322-863-A	o	MOUNTED CIRCUIT BOARD, AF-27 (U68)
2	A-8322-868-A	s	SPRING ASSY, BATTERY
3	A-8322-877-A	o	MOUNTED CIRCUIT BOARD, RF-90 (U64) (FOR U64 MODEL)
	A-8322-873-A	o	MOUNTED CIRCUIT BOARD, RF-90 (U66) (FOR U66 MODEL)
	A-8322-865-A	o	MOUNTED CIRCUIT BOARD, RF-90 (U68) (FOR U68 MODEL)
4	X-2542-174-1	o	FRAME ASSY
5	X-2542-179-1	s	ANTENNA ASSY (64) (FOR U64 MODEL)
	X-2542-178-1	s	ANTENNA ASSY (66) (FOR U66 MODEL)
	X-2542-177-1	s	ANTENNA ASSY (68) (FOR U68 MODEL)
6	1-750-551-11	o	CONNECTOR, XLA 3P
7	2-545-692-01	s	SPRING (HOT), BATTERY
8	2-545-696-01	s	SCREW (S) (M1.7X8)
9	2-545-770-01	s	SHAFT (DIA. 1.6X32)
10	2-545-771-01	o	SHEET (PWR)
11	2-545-773-01	o	INSULATING SHEET, FRAME
12	2-545-774-01	s	RING
13	2-545-775-01	s	SPRING (RING), COIL
14	2-545-776-01	o	SCREW (CASE), SWITCHING
15	2-545-780-01	s	TAPPING (DIA. 1.7X2.2)
16	2-545-781-01	s	TERMINAL (LID), BATTERY
17	2-545-782-01	s	SCREW (LID), SWITCHING
18	2-545-785-01	s	LID, BATTERY
19	2-545-787-01	o	BRACKET, CONNECTOR
20	2-545-788-01	o	PLATE, LIGHT GUIDE
21	2-545-789-01	o	CASE (FRONT)
22	2-545-790-01	o	CASE (REAR)
23	2-545-792-01	o	PANEL, CONTROL
24	2-545-805-01	s	+P 2X3.5
25	2-545-818-01	s	SHEET, COPPER LEAF
26	2-545-819-01	s	SHEET, ABSORPTION
27	2-545-819-11	s	SHEET, ABSORPTION
28	2-545-821-01	s	B TITE 2X4
29	3-880-990-00	s	SCREW,FLAT (+) 1.7X3 (STEEL)
Screws/Washers			
	7-624-104-04	s	STOP RING,E-2


21
20
23
29
26
5
29
3
6
27
12
29
29
13
19
1
Suppied with 6
10
25
4
28
2
11
7
15
16
9
14
STOP RING, E2
22
7
18
17
8
8
24

5-3. Electrical Parts List

AF-27 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8322-863-A	o	MOUNTED CIRCUIT BOARD, AF-27
C101	1-104-852-11	s	CAPACITOR,TANTALUM 22MF/10V
C102	1-115-416-11	s	CAPACITOR,CERAMIC 1000PF/25V
C103	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C104	1-113-600-11	s	CAPACITOR,CHIP TANTALUM 2.2MF
C105	1-104-847-11	s	CAPACITOR TANTALUM 22MF/4V
C106	1-110-569-21	s	CAPACITOR CHIP TANTAL 47MF/6.3
C107	1-162-965-11	s	CAPACITOR,CERAMIC 1500PF/50V B
C108	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C109	1-117-919-11	s	CAPACITOR, CHIP TANTALUM10MF
C110	1-115-419-11	s	CAPACITOR,CHIP CERAMIC3300PF
C111	1-164-739-11	s	CAPACITOR CERAMIC 560PF (1608)
C112	1-113-600-11	s	CAPACITOR,CHIP TANTALUM 2.2MF
C113	1-113-600-11	s	CAPACITOR,CHIP TANTALUM 2.2MF
C114	1-107-688-21	s	CAPACITOR,TANTALUM 1.5MF/25V
C115	1-113-600-11	s	CAPACITOR,CHIP TANTALUM 2.2MF
C116	1-104-847-11	s	CAPACITOR TANTALUM 22MF/4V
C117	1-165-176-11	s	CAPACITOR,CERAMIC 47000PF/16V
C118	1-164-230-11	s	CAPACITOR,CERAMIC 220PF/50V
C119	1-117-919-11	s	CAPACITOR, CHIP TANTALUM10MF
C120	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C121	1-117-919-11	s	CAPACITOR, CHIP TANTALUM10MF
C122	1-164-230-11	s	CAPACITOR,CERAMIC 220PF/50V
C123	1-104-915-11	s	CAPACITOR,CHIP 2.2MF/20V
C124	1-117-919-11	s	CAPACITOR, CHIP TANTALUM10MF
C125	1-165-176-11	s	CAPACITOR,CERAMIC 47000PF/16V
C126	1-115-416-11	s	CAPACITOR,CERAMIC 1000PF/25V
C127	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C128	1-111-253-11	s	CAPACITOR TANTALUM 100MF/6.3V
C129	1-113-600-11	s	CAPACITOR,CHIP TANTALUM 2.2MF
C130	1-164-174-11	s	CAPACITOR,CERAMIC 8200PF/25V B
C132	1-113-600-11	s	CAPACITOR,CHIP TANTALUM 2.2MF
C133	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C134	1-113-600-11	s	CAPACITOR,CHIP TANTALUM 2.2MF
C136	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C137	1-162-915-11	s	CAPACITOR,CERAMIC 10PF/50V CH
C138	1-113-600-11	s	CAPACITOR,CHIP TANTALUM 2.2MF
C139	1-107-688-21	s	CAPACITOR,TANTALUM 1.5MF/25V
C201	1-104-852-11	s	CAPACITOR,TANTALUM 22MF/10V
C202	1-162-919-11	s	CAPACITOR,CERAMIC 22PF/50V CH
C203	1-162-920-11	s	CAPACITOR,CERAMIC 27PF/50V CH
C204	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C205	1-162-919-11	s	CAPACITOR,CERAMIC 22PF/50V CH
C206	1-162-920-11	s	CAPACITOR,CERAMIC 27PF/50V CH
C207	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C208	1-162-966-11	s	CAPACITOR,CERAMIC 2200PF/50V B
C209	1-162-959-11	s	CAPACITOR,CERAMIC 330PF/50V SL
C210	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C211	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C212	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C213	1-117-919-11	s	CAPACITOR, CHIP TANTALUM10MF
C214	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C215	1-113-600-11	s	CAPACITOR,CHIP TANTALUM 2.2MF
C301	1-117-887-11	s	CAPACITOR,TANTALUM 220MF/6.3V
C302	1-117-887-11	s	CAPACITOR,TANTALUM 220MF/6.3V
C303	1-115-170-11	s	CAPACITOR,TANTAL(SMD)4.7MF/10V
C304	1-162-977-11	s	CAPACITOR,CERAMIC 1800P/50V(B)
C305	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B

(AF-27 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C306	1-162-923-11	s	CAPACITOR,CERAMIC 47PF/50V CH
C307	1-117-372-11	s	CAP,ELECT (SMD) 100MF/10V
C308	1-104-852-11	s	CAPACITOR,TANTALUM 22MF/10V
C309	1-115-170-11	s	CAPACITOR,TANTAL(SMD)4.7MF/10V
C310	1-110-569-21	s	CAPACITOR CHIP TANTAL 47MF/6.3
CN102	1-793-433-11	o	HOUSING,CONNECTOR(PC BOARD)14P
CN103	1-770-621-21	s	PIN, CONNECTOR 4P
CN301	1-770-619-11	o	PIN, CONNECTOR 2P
D101	8-719-039-99	s	DIODE UMZ8.2T
D102	8-719-039-99	s	DIODE UMZ8.2T
D103	8-719-421-69	s	DIODE MA133
D104	8-719-421-69	s	DIODE MA133
D301	8-719-988-61	s	DIODE 1SS355TE-17
D302	8-719-049-09	s	DIODE 1SS367-T3SONY
D303	8-719-039-99	s	DIODE UMZ8.2T
FL102	1-233-322-11	s	FILTER, CHIP EMI
IC101	8-759-466-68	s	IC MC33077D (R2)
IC102	8-759-710-79	s	IC NJM2107F
IC103	8-759-466-68	s	IC MC33077D (R2)
IC104	8-759-539-60	s	IC SA575DK-T
IC201	8-759-530-29	s	IC TC4069UBFT (EL,N)
IC202	8-759-209-69	s	IC TC4S11F
IC203	8-759-082-61	s	IC TC4W53FU
IC301	8-759-466-67	s	IC RH5RH503B-T1
L301	1-414-398-11	s	INDUCTOR (SMD) 10UH
Q201	8-729-015-66	s	TRANSISTOR 2SC4919
Q301	8-729-041-51	s	TRANSISTOR FMMT617TA
Q302	8-729-929-73	s	TRANSISTOR UMG8-TL
Q303	8-729-425-18	s	TRANSISTOR XN4504
Q304	8-729-425-64	s	TRANSISTOR 2SD2216Q
R101	1-216-815-11	s	RESISTOR,CHIP 330 1/16W 1608
R102	1-216-832-11	s	RESISTOR,CHIP 8.2K 1/16W 1608
R103	1-216-807-11	s	RESISTOR, CHIP 68 1/16W 1608
R104	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W 1608
R105	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W 1608
R106	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R107	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W 1608
R108	1-218-271-11	s	RESISTOR,CHIP 2K 1/16W (1608)
R109	1-218-712-11	s	RESISTOR,METAL 6.8K 1/16W
R110	1-218-712-11	s	RESISTOR,METAL 6.8K 1/16W
R111	1-218-710-11	s	RESISTOR,CHIP 5.6K 1/16W(1608)
R112	1-218-707-11	s	RESISTOR,CHIP 4.3K 1/16W(1608)
R113	1-216-855-11	s	RESISTOR, CHIP 680K 1/16W 1608
R114	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W 1608
R115	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R116	1-216-822-11	s	RESISTOR, CHIP 1.2K 1/16W 1608
R117	1-218-710-11	s	RESISTOR,CHIP 5.6K 1/16W(1608)
R118	1-216-839-11	s	RESISTOR,CHIP 33K 1/16W 1608
R119	1-216-839-11	s	RESISTOR,CHIP 33K 1/16W 1608
R120	1-216-822-11	s	RESISTOR, CHIP 1.2K 1/16W 1608
R121	1-218-710-11	s	RESISTOR,CHIP 5.6K 1/16W(1608)
R122	1-218-711-11	s	RESISTOR,METAL 6.2K 1/16W
R123	1-218-690-11	s	RESISTOR CHIP 820 1/16W (1608)
R125	1-218-707-11	s	RESISTOR,CHIP 4.3K 1/16W(1608)
R126	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W 1608
R127	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)

(AF-27 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R131	1-216-864-11	s	RESISTOR,CHIP 0 1/16W (1608)
R132	1-216-829-11	s	RESISTOR, CHIP 4.7K 1/16W 1608
R134	1-216-850-11	s	RESISTOR,CHIP 270K 1/16W 1608
R135	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W 1608
R201	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R202	1-219-570-11	s	RESISTOR,CHIP 10M 1/16W
R203	1-216-853-11	s	RESISTOR,CHIP 470K 1/16W 1608
R204	1-219-570-11	s	RESISTOR,CHIP 10M 1/16W
R205	1-216-853-11	s	RESISTOR,CHIP 470K 1/16W 1608
R206	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W 1608
R207	1-216-829-11	s	RESISTOR, CHIP 4.7K 1/16W 1608
R208	1-216-829-11	s	RESISTOR, CHIP 4.7K 1/16W 1608
R209	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R210	1-216-848-11	s	RESISTOR,CHIP 180K 1/16 (1608)
R211	1-216-829-11	s	RESISTOR, CHIP 4.7K 1/16W 1608
R212	1-216-829-11	s	RESISTOR, CHIP 4.7K 1/16W 1608
R213	1-216-825-11	s	RESISTOR,CHIP 2.2K 1/16W 1608
R214	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R215	1-216-839-11	s	RESISTOR,CHIP 33K 1/16W 1608
R216	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R217	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R218	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R219	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W 1608
R220	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R221	1-216-839-11	s	RESISTOR,CHIP 33K 1/16W 1608
R222	1-216-829-11	s	RESISTOR, CHIP 4.7K 1/16W 1608
R223	1-216-829-11	s	RESISTOR, CHIP 4.7K 1/16W 1608
R224	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W 1608
R301	1-216-823-11	s	RESISTOR, CHIP 1.5K
R302	1-218-740-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R304	1-216-797-11	s	RESISTOR,CHIP 10 1/16W 1608
R305	1-216-826-11	s	RESISTOR,CHIP 2.7K 1/16(1608)
R306	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R307	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R308	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
RV101	1-225-878-21	s	RESISTOR,VAR,CARBON 20K
RV201	1-223-348-11	s	RES, ADJ, CERMET 22K
RV202	1-223-349-11	s	RESISTOR,ADJ,CERMET 47K
S301	1-771-667-11	s	SWITCH, SLIDE
S401	1-553-977-00	s	SWITCH,SLIDE (2-1-2)
T301	1-433-795-11	s	TRANSFORMER, DC-DC CONVETER
X201	1-767-100-11	s	VIBRATOR, CRYSTAL
X202	1-760-252-12	s	VIBRATOR, CRYSTAL

RF-90 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-8322-865-A	o	MOUNTED CIRCUIT BOARD, RF-90 (FOR U68 MODEL)
1pc	A-8322-873-A	o	MOUNTED CIRCUIT BOARD, RF-90 (FOR U66 MODEL)
1pc	A-8322-877-A	o	MOUNTED CIRCUIT BOARD, RF-90 (FOR U64 MODEL)
1pc	X-2542-177-1	s	ANTENNA ASSY (68) (FOR U68 MODEL)
1pc	X-2542-178-1	s	ANTENNA ASSY (66) (FOR U66 MODEL)
1pc	X-2542-179-1	s	ANTENNA ASSY (64) (FOR U64 MODEL)
C401	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C402	1-115-416-11	s	CAPACITOR,CERAMIC 1000PF/25V
C403	1-110-569-21	s	CAPACITOR CHIP TANTAL 47MF/6.3
C404	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C405	1-165-176-11	s	CAPACITOR,CERAMIC 47000PF/16V
C406	1-162-919-11	s	CAPACITOR,CERAMIC 22PF/50V CH
C407	1-135-181-21	s	CAPACITOR TANTALUM 4.7MF/6.3V
C408	1-110-569-21	s	CAPACITOR CHIP TANTAL 47MF/6.3
C409	1-165-176-11	s	CAPACITOR,CERAMIC 47000PF/16V
C410	1-165-176-11	s	CAPACITOR,CERAMIC 47000PF/16V
C411	1-107-826-11	s	CAPACITOR,CHIP CERAMIC 0.1MF
C412	1-107-826-11	s	CAPACITOR,CHIP CERAMIC 0.1MF
C413	1-110-569-21	s	CAPACITOR CHIP TANTAL 47MF/6.3
C414	1-117-887-11	s	CAPACITOR,TANTALUM 220MF/6.3V
C415	1-110-569-21	s	CAPACITOR CHIP TANTAL 47MF/6.3
C416	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C417	1-162-927-11	s	CAPACITOR,CERAMIC 100PF/50V CH
C418	1-135-181-21	s	CAPACITOR TANTALUM 4.7MF/6.3V
C419	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C420	1-115-416-11	s	CAPACITOR,CERAMIC 1000PF/25V
C421	1-162-919-11	s	CAPACITOR,CERAMIC 22PF/50V CH
C422	1-115-416-11	s	CAPACITOR,CERAMIC 1000PF/25V
C423	1-162-923-11	s	CAPACITOR,CERAMIC 47PF/50V CH
C424	1-162-923-11	s	CAPACITOR,CERAMIC 47PF/50V CH
C425	1-162-907-11	s	CAPACITOR,CERAMIC 2PF/50V(CK)
C426	1-162-908-11	s	CAPACITOR,CERAMIC 3PF/50V 1608
C427	1-162-908-11	s	CAPACITOR,CERAMIC 3PF/50V 1608
C428	1-115-416-11	s	CAPACITOR,CERAMIC 1000PF/25V
C429	1-162-923-11	s	CAPACITOR,CERAMIC 47PF/50V CH
C430	1-162-908-11	s	CAPACITOR,CERAMIC 3PF/50V 1608
C501	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C502	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C503	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C504	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C505	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C506	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C508	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C511	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C512	1-104-851-11	s	CAPACITOR,TANTALUM 10MF/10V
C513	1-107-826-11	s	CAPACITOR,CHIP CERAMIC 0.1MF
C514	1-107-826-11	s	CAPACITOR,CHIP CERAMIC 0.1MF
C515	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C516	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C551	1-162-921-11	s	CAPACITOR,CERAMIC 33PF/50V CH
C552	1-162-910-11	s	CAPACITOR,CERAMIC 5PF/50V 1608
C553	1-162-970-11	s	CAPACITOR CERAMIC 0.01MF/25V B
C554	1-135-179-21	s	CAPACITOR,TANTALUM 2.2MF/16V

(RF-90 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
CN402	1-774-915-11	s	CONNECTOR, COAXIAL
CN501	1-793-432-11	o	PIN, CONNECTOR (PC BOARD) 14P
CP401	1-760-668-21	s	OSCILLATOR (VOLTAGE VAR TYPE) (FOR U68 MODEL)
	1-760-948-21	s	OSCILLATOR (VOLTAGE VAR TYPE) (FOR U64 MODEL)
	1-781-516-21	s	OSCILLATOR (VOLTAGE VAR TYPE) (FOR U66 MODEL)
CP402	1-251-820-11	s	COUPLING DIRECTION
CP403	1-251-830-21	s	ISOLATOR (FOR U68 MODEL)
	1-759-204-21	s	ISOLATOR (FOR U64,U66 MODEL)
CT301	1-141-322-11	s	CAPACITOR,VAR,TRIMMER
CT401	1-141-435-21	s	CAPACITOR TRIMMER (CHIP TYPE)
D401	8-719-158-35	s	DIODE RD9.1SB (ZENER)
D403	8-719-421-69	s	DIODE MA133
D404	8-719-421-69	s	DIODE MA133
D501	8-719-158-35	s	DIODE RD9.1SB (ZENER)
D502	8-719-075-69	s	DIODE SPR-39MVWFMN
D503	8-719-075-69	s	DIODE SPR-39MVWFMN
D509	8-719-158-35	s	DIODE RD9.1SB (ZENER)
D510	8-719-158-35	s	DIODE RD9.1SB (ZENER)
D511	8-719-158-35	s	DIODE RD9.1SB (ZENER)
D512	8-719-158-35	s	DIODE RD9.1SB (ZENER)
D513	8-719-158-35	s	DIODE RD9.1SB (ZENER)
D514	8-719-158-35	s	DIODE RD9.1SB (ZENER)
D515	8-719-158-35	s	DIODE RD9.1SB (ZENER)
D516	8-719-158-35	s	DIODE RD9.1SB (ZENER)
FL401	1-233-939-11	s	FILTER, LOW PASS (SMD TYPE)
IC401	8-752-069-39	s	IC CXA1786N
IC402	8-759-493-53	s	IC S-81233SGUP-DQF-T1
IC501	8-759-639-29	o	IC HD6473644W-T808-V1.0
IC551	8-759-096-87	s	IC TC7WU04FU (TE12R)
IC552	8-759-578-59	s	IC S-80845ALNP-EA9-T2
L401	1-410-658-31	s	INDUCTOR,CHIP 220UH (3225)
L402	1-410-658-31	s	INDUCTOR,CHIP 220UH (3225)
L403	1-414-461-31	s	INDUCTOR, CHIP (K) 6.8NH
L404	1-414-461-31	s	INDUCTOR, CHIP (K) 6.8NH
L405	1-414-463-41	s	INDUCTOR, CHIP (J) 10NH
L406	1-414-465-31	s	INDUCTOR, CHIP (J) 15NH
L407	1-414-465-31	s	INDUCTOR, CHIP (J) 15NH
L408	1-414-579-41	s	INDUCTOR, CHIP (J) 82NH
Q401	8-729-425-64	s	TRANSISTOR 2SD2216Q
Q402	8-729-031-69	s	TRANSISTOR 2SA1965-TL
Q403	8-729-031-69	s	TRANSISTOR 2SA1965-TL
Q404	8-729-039-32	s	TRANSISTOR 2SC5015-T1
Q405	8-729-231-69	s	TRANSISTOR 2SC3607-TE12L
Q406	8-729-929-11	s	TRANSISTOR DTC143ZE
Q407	8-729-425-64	s	TRANSISTOR 2SD2216Q
Q501	8-729-928-27	s	TRANSISTOR DTA144EE
Q502	8-729-928-27	s	TRANSISTOR DTA144EE
Q503	8-729-928-27	s	TRANSISTOR DTA144EE
Q504	8-729-928-27	s	TRANSISTOR DTA144EE
R401	1-216-837-11	s	RESISTOR,CHIP 22K 1/16W 1608
R402	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W 1608
R403	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)

(RF-90 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R404	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R405	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R406	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R407	1-216-809-11	s	RESISTOR,CHIP 100 1/16W 1608
R408	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W 1608
R409	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W 1608
R410	1-220-151-11	s	RESISTOR,CHIP 51 1/16W (1608)
R411	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R412	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
R413	1-216-825-11	s	RESISTOR,CHIP 2.2K 1/16W 1608
R414	1-216-836-11	s	RESISTOR, CHIP 18K 1/16W 1608
R415	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W 1608
R416	1-216-801-11	s	RESISTOR,CHIP 22 1/16W 1608 (FOR U66,U68 MODEL)
	1-216-802-11	s	RESISTOR,CHIP 27 1/16W 1608 (FOR U64 MODEL)
R417	1-216-823-11	s	RESISTOR, CHIP 1.5K (FOR U64 MODEL)
	1-216-826-11	s	RESISTOR, CHIP 2.7K 1/16W 1608 (FOR U66,U68 MODEL)
R418	1-216-811-11	s	RESISTOR, CHIP 150 1/16W 1608 (FOR U68 MODEL)
	1-216-812-11	s	RESISTOR, CHIP 180 1/16W 1608 (FOR U66 MODEL)
	1-216-813-11	s	RESISTOR, CHIP 220 1/16W 1608 (FOR U64 MODEL)
R419	1-216-825-11	s	RESISTOR,CHIP 2.2K 1/16W 1608
R420	1-216-821-11	s	RESISTOR,CHIP 1.0K 1/16W 1608
R421	1-216-833-11	s	RESISTOR,CHIP 10K 1/16W 1608
R422	1-216-797-11	s	RESISTOR,CHIP 10 1/16W 1608
R501	1-216-864-11	s	RESISTOR,CHIP 0 1/16W (1608)
R502	1-216-864-11	s	RESISTOR,CHIP 0 1/16W (1608) (FOR U64,U66 MODEL)
R503	1-216-864-11	s	RESISTOR,CHIP 0 1/16W (1608) (FOR U64 MODEL)
R506	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R507	1-216-822-11	s	RESISTOR, CHIP 1.2K 1/16W 1608
R508	1-216-822-11	s	RESISTOR, CHIP 1.2K 1/16W 1608
R509	1-216-822-11	s	RESISTOR, CHIP 1.2K 1/16W 1608
R510	1-216-822-11	s	RESISTOR, CHIP 1.2K 1/16W 1608
R511	1-216-815-11	s	RESISTOR,CHIP 330 1/16W 1608
R512	1-216-815-11	s	RESISTOR,CHIP 330 1/16W 1608
R551	1-216-857-11	s	RESISTOR, CHIP 1.0M 1/16W 1608
R552	1-216-824-11	s	RESISTOR, CHIP 1.8K 1/16W 1608
R553	1-216-845-11	s	RESISTOR,CHIP 100K 1/16W(1608)
R554	1-216-841-11	s	RESISTOR, CHIP 47K 1/16W 1608
RB501	1-236-907-11	s	RESISTOR BLOCK 100K (1608)
RB504	1-236-907-11	s	RESISTOR BLOCK 100K (1608)
RB505	1-236-907-11	s	RESISTOR BLOCK 100K (1608)
RV401	1-223-347-11	s	RES, ADJ, CERMET 10K
S504	1-771-758-11	s	SWITCH, ROTARY CODE
S505	1-771-758-11	s	SWITCH, ROTARY CODE
X551	1-760-474-11	s	VIBRATOR, CRYSTAL

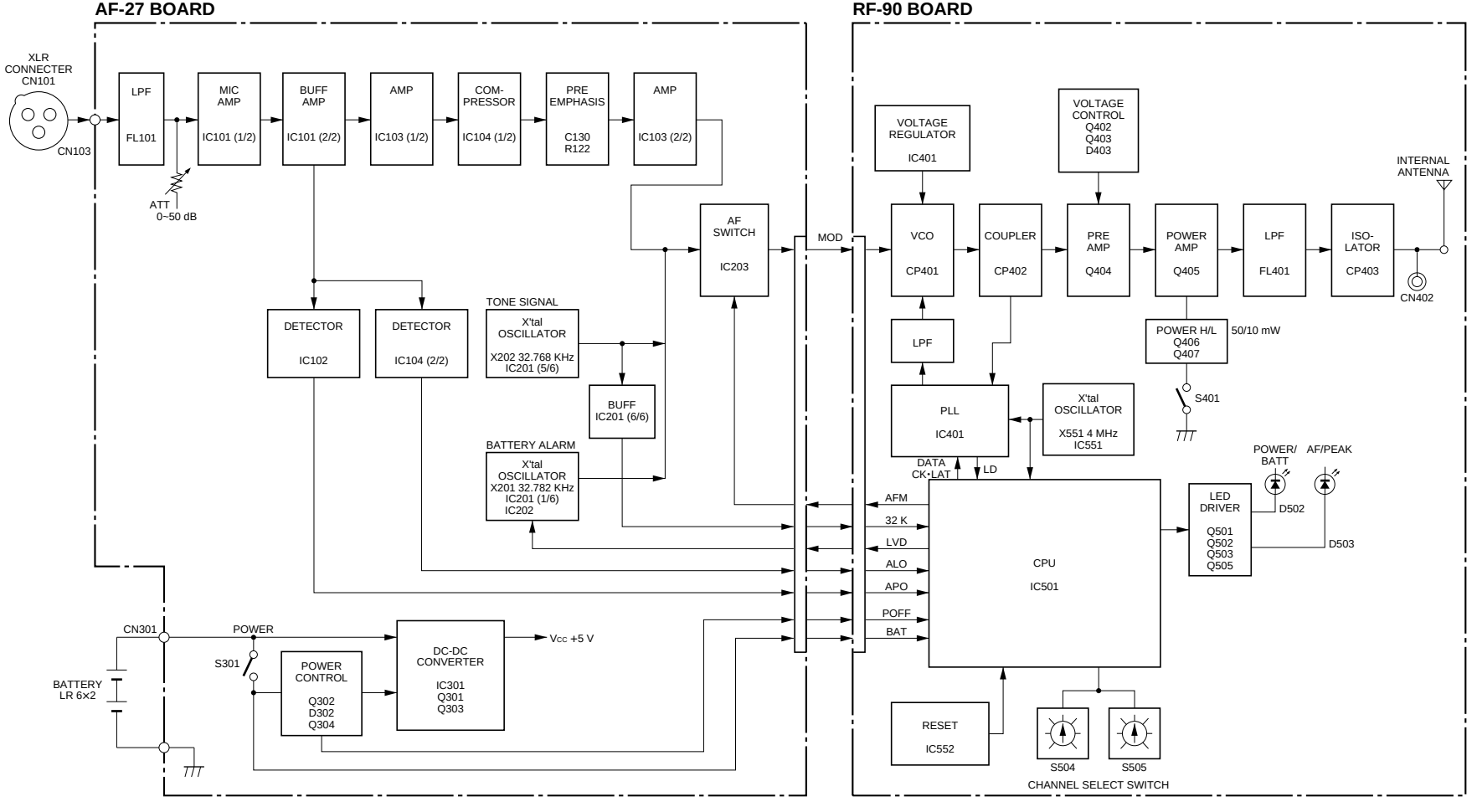
FRAME

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-750-551-11	o	CONNECTOR, XLA 3P

5-4. Accessories Supplied

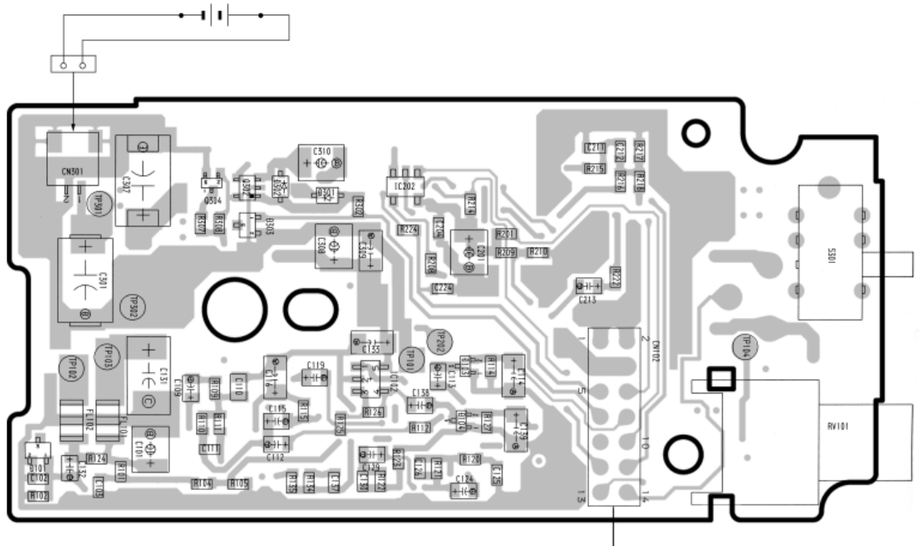
Ref. No. or Q'ty	Part No.	SP	Description
1pc	3-866-919-12	s	MANUAL, INSTRUCTION

Overall Block Diagram

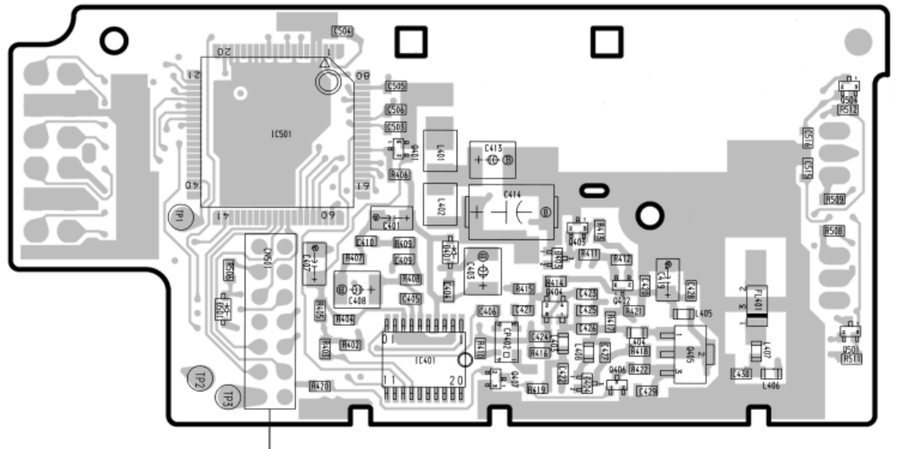


Section 7
Board Layouts and Schematic Diagrams

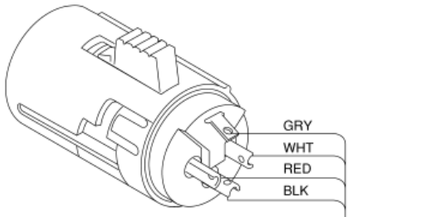
7-1. Board Layouts

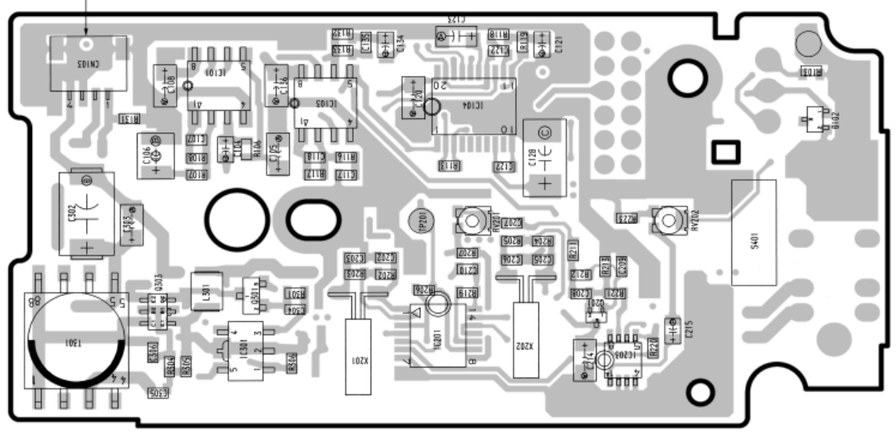


AF-27 -A SIDE-
1-674-806-12

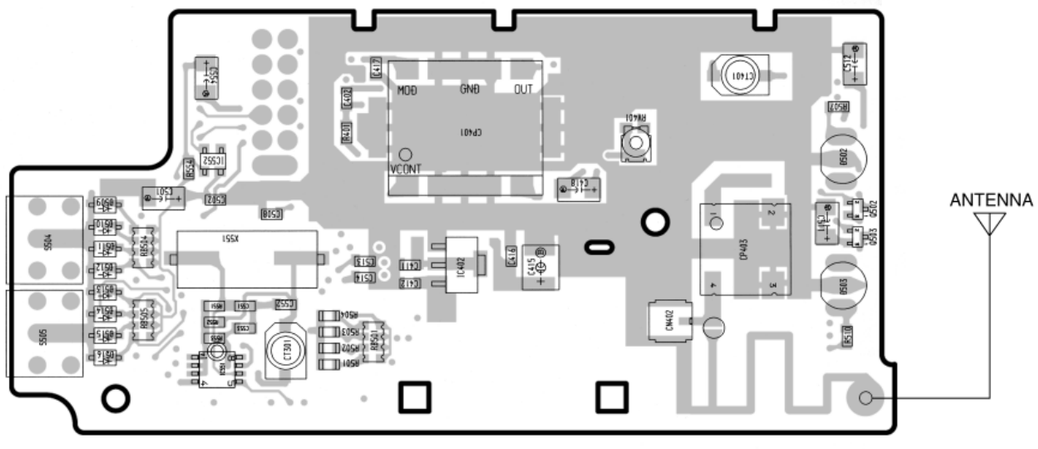


RF-90 -A SIDE-
1-674-807-12



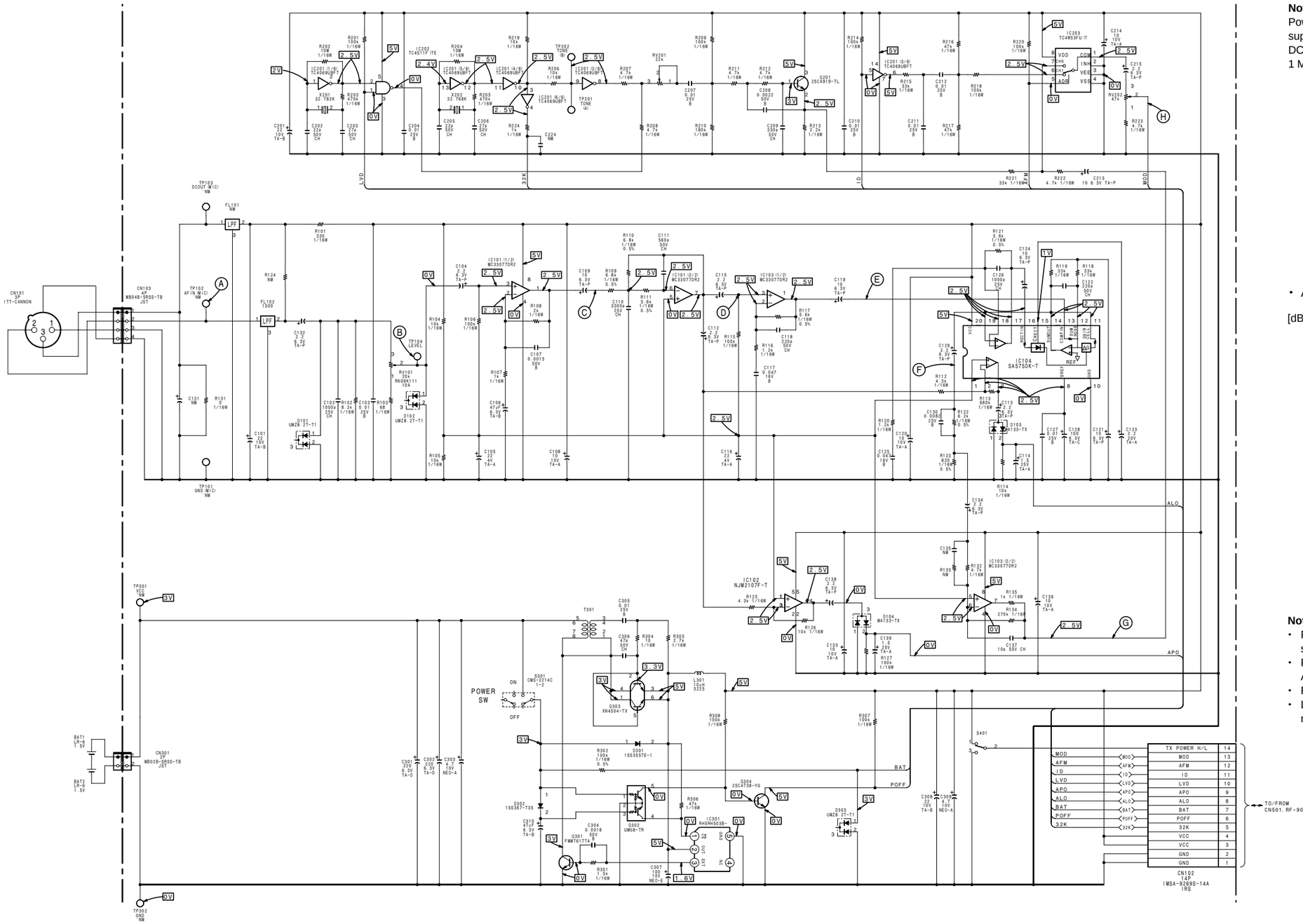


AF-27 -B SIDE-
1-674-806-12



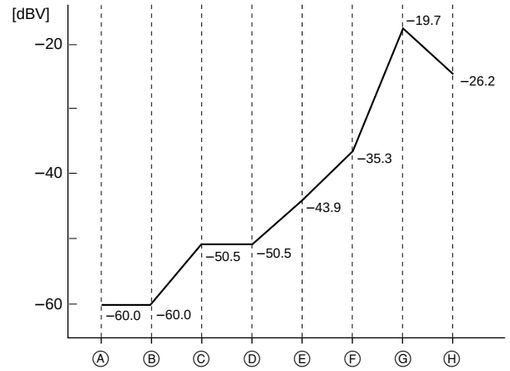
RF-90 -B SIDE-
1-674-807-12

7-2. Schematic Diagrams



Note:
Power voltage is 3.0 Vdc and fed with regulated dc power supply from battery terminal.
DC valtage are taken with digital multimeter (input impedance 1 MΩ or more) under no-signal conditions.

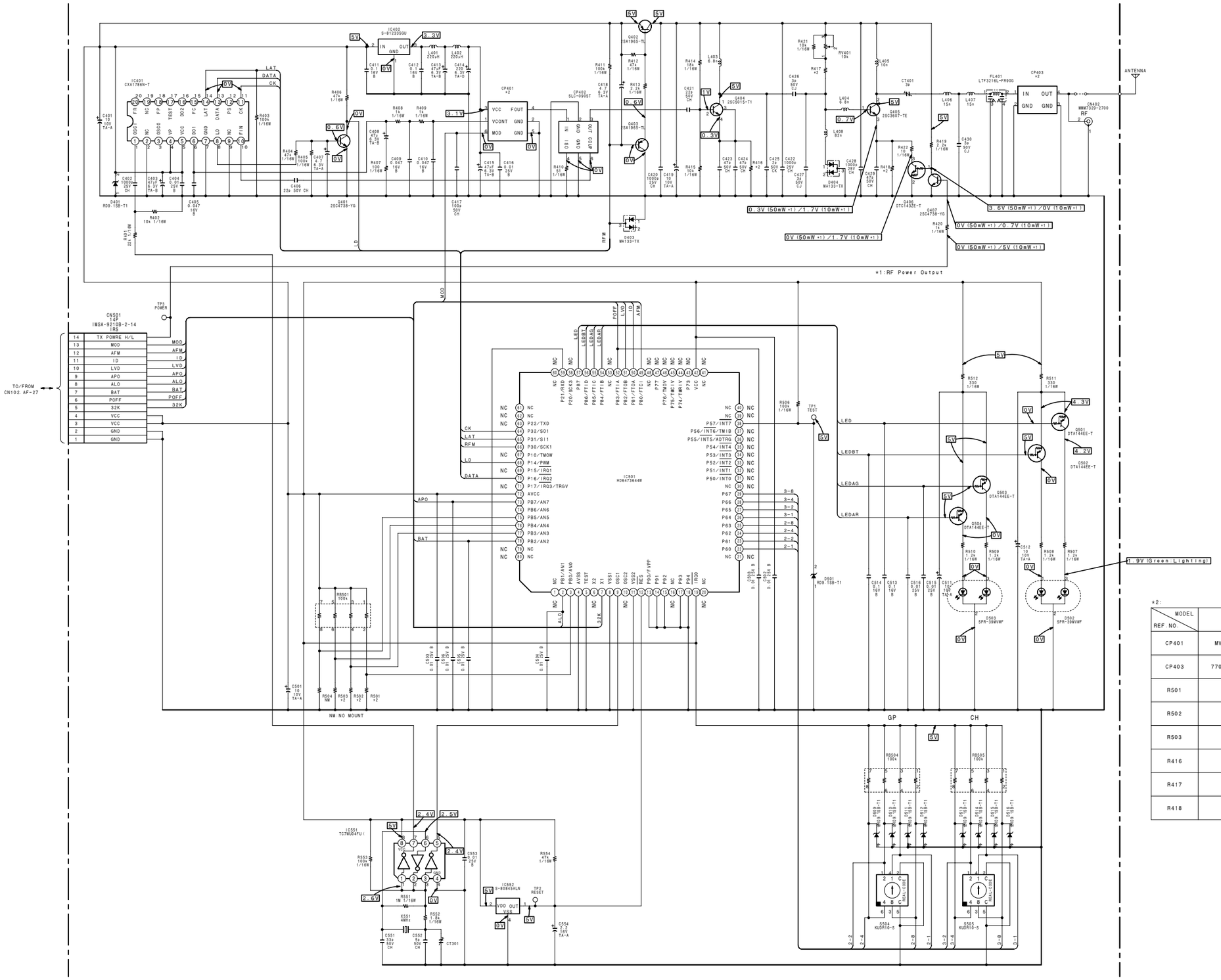
- AF LEVEL DIAGRAM



Frequency Deviation : ±5 kHz

Note:
- Power voltage is 3.0 Vdc and fed with regulated dc power supply from battery terminal.
- Reference input signal is –60 dBV (0 dBV = 1 Vrms) and fed with AF oscillator from MIC connector.
- For measuring points (Ⓐ to Ⓗ), see schematic diagram.
- Level values are referential values measured with AF level meter.

AF-27



Note:
Power voltage is 3.0 Vdc and fed with regulated dc power supply from battery terminal.
DC valtage are taken with digital multimeter (input impedance 1 MΩ or more) under no-signal conditions.

*2:

REF.NO. \ MODEL	U64	U66	U68
CP401	MVU-779I	MVU-788I	MVU-798I
CP403	770-794MHz	770-794MHz	792-820MHz
R501	0	0	0
R502	0	0	NM
R503	0	NM	NM
R416	27	22	22
R417	1.5K	2.7K	2.7K
R418	220	180	150

NM:NO MOUNT